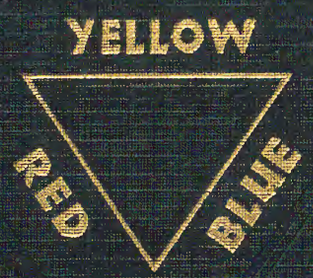
YELLOW
RED
BLUE

COLOR
IN SKETCHING AND RENDERING

COLOR
IN SKETCHING AND RENDERING

By
ARTHUR L. GUPTILL

Introduction by
J. FLOYD YEWELL

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To

MY WIFE

ETHEL WEIR GUPTILL

WHO MODESTLY FORBIDS ME TO JOIN
HER NAME TO MINE ON THE TITLE PAGE,
WHERE IT SO DESERVEDLY BELONGS

PREFACE

The scope of this volume is limited mainly to a consideration of the practical uses of color in pigment form—and particularly water color—in what is commonly termed representative painting.

The text, like that of its companion volumes, *Sketching and Rendering in Pencil* and *Drawing with Pen and Ink,* is largely based on talks and demonstrations which the author has given over a long period of time in his various classes in Art, Architecture, and Interior Decoration—especially those at Pratt Institute and the Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y. This material, originally a compilation or adaptation of ideas of widespread derivation, was there subjected to lengthy tests in that best of all possible proving grounds, the classroom, until finally it became amalgamated into intensive yet comprehensive courses of study which form the foundation for this volume.

This classroom material has here been thoroughly revised and greatly amplified in order to bring it up to date and to fit it to the needs of an enlarged audience. In this revision and amplification the author has drawn freely on his broad experience in the fields of advertising art and architectural illustration, adopting also numerous suggestions for which he is indebted to fellow teachers and other colleagues in the art and architectural world. Nor has he hesitated to profit from the excellent books which bear on one or another phase of the subject, to many of which direct references will be found.

The content of Part I is suggested by its title "The Elements of Water Color Painting." The aim has been to give a thorough grounding in such fundamentals of the art as the beginner must master before he can hope for any real progress, plus an adequate consideration of many advanced essentials. It is presupposed that the reader of these first chapters knows nothing of the subject beyond the elements of freehand sketching. Both text and illustrations have therefore been made unusually complete, with particular emphasis on those matters which repeatedly prove stumbling blocks to the beginner. His questions are anticipated; he is told why one thing is done and another not done; how this or that effect can be obtained; how errors can be corrected and pitfalls escaped. Dogmatism is avoided, however, the reader being urged to test all points by means of well organized experiments suggested for the purpose.

In the first chapters he learns about his materials, performing numerous exercises in the technique of water color painting. Though these are mainly simple, some of them reveal tricks of the professional such as seldom find their way into print. Next he is guided through a series of progressively arranged lessons designed to acquaint him with such matters as color theory, values, color harmony, and pictorial composition. Step by step he advances to work from the photograph, the analysis and profitable use of paintings by other artists, and the representation of still life. He should be qualified, as he comes to the final chapters of Part I, to tackle the problems involved in the sketching of complete interiors, as well as all sorts of outdoor subjects. Particular attention is given to such details as skies, trees, and water.

Though emphasis is on transparent water color, related mediums are not wholly neglected, particularly as they relate to the work of the aquarellist, considerable space being devoted to the use of opaque pigments, black and colored inks, pastels, colored pencils and crayons, oil paints, and colored papers. Through all this variety, over-attention to any one medium, method, or type of work has been avoided. In fact, every effort has been made to encourage the reader to develop his art in the manner natural to his temperament and purpose. Stress is constantly placed on the importance of learning to observe intelligently, to record with facility, and to memorize accurately. The way is also pointed to original investigation and experimentation—a way which should lead the persevering student well along towards his ultimate goal, the full growth of his individual powers of pictorial expression.

In Part II, entitled "Architectural Rendering in Color," the content changes somewhat, for here both text and illustration take on a decidedly architectural flavor, the primary aim being to help in the solution of such problems of color representation as are peculiar to

the architect and such of his professional relatives as the landscape architect and the interior decorator. Not only do these individuals or their assistants make numerous preliminary studies, details of ornament, color schemes for building materials, etc. (in which color is involved), but they are frequently faced with the difficult task of picturing on paper entire projects which are as yet merely proposed—buildings singly or in groups, landscape settings, interiors and the like. Each of these projects, no matter how visionary, must be drawn so definitely and convincingly that the client or any layman concerned can see, before a contract is let or a tool lifted, exactly how it will look when completed. And if such drawings are to be submitted to prospective clients, perhaps competitively (as they often are when new commissions are sought), they must be unusually attractive as well.

As Part II deals with many such matters, it should prove of extreme value to anyone who desires to gain facility in this direction. Taken in conjunction with Part I it forms what is undoubtedly the most exhaustive volume on architectural sketching and rendering ever published. This makes it a logical text and reference book for the groups just mentioned, as well as for that professional architectural-artist known as a "renderer," "delineator," or "architectural illustrator." His needs have been too long neglected, there being almost nothing until now, with the exception of Harbeson's *The Study of Architectural Design,* Magonigle's *Architectural Rendering in Wash,* and Farey and Edwards' *Architectural Drawing*—and these scarcely more than touch on color—dealing with these problems in more than an incidental way. Here we offer him, in a single source, such information as he has hitherto been forced to dig out for himself a bit at a time.

Whether one is interested in professional rendering, or merely in acquiring a few tricks of the art, he will find the content of Part II so arranged as to permit rapid assimilation and immediate application. He is led by gradual steps from a consideration of the treatment of such portions of buildings as bricks and stones, windows, roofs, and chimneys, to the study of the exteriors of complete structures—residences, churches, banks, schools, office buildings, and the like—together with their landscape settings and accessories. Perspectives and elevations are taken up in turn. Interiors are also discussed, together with details of furniture, lighting fixtures, ornamental ceilings, leaded glass, etc.

In Part II it is taken for granted that the reader has somewhat more advanced qualifications than are needed for the exercises in Part I. He will find himself under a decided handicap unless he is familiar with architectural drafting, including instrumental perspective and shades and shadows. The greater his skill at freehand drawing the better. And the broader his understanding and appreciation of architecture itself—to say nothing of landscape architecture and interior decoration—the finer his equipment for rendering will be, for the delineator is likely to be called upon to interpret the designs of many different architects. Some architects design directly in perspective, too, and are inclined to rely on the delineator for intelligent cooperation. It is the lack of sound knowledge of architecture and related subjects which prevents the average so-called "commercial" artist from doing architectural rendering satisfactorily.

Rendering, incidentally (especially free-lance work), offers the renderer splendid training in architecture, as he is constantly in contact with architects and designers: through rendering their work he becomes familiar with it, gaining also the benefit of their comments and criticisms.

There is no reason why the well-trained draftsman, with rare exceptions, cannot develop in a comparatively short time considerable skill at rendering—enough, at least, to serve him as an enjoyable accomplishment and perhaps even to make him a more valuable man to his employer. Such skill may help him far more than he anticipates; frequently even a moderate degree of facility in this direction results in one's advancement to a position of increased responsibility with correspondingly higher salary, tending also to insure his retention on the payroll if work is somewhat slack. Or if he has this skill, in addition to his other qualifications, he may find it decidedly in his favor if he seeks a new position. Proficiency at rendering is also of value to the young architect trying to build a practice of his own, many a commission being "landed" by a good presentation study.

If one discovers that he has exceptional ability in this direction, he may choose to make

architectural rendering his life's work. We are inclined to advise against this, however, for there is not enough of this sort of thing required to keep more than a few men steadily employed. The work is very confining and exacting, too, being unusually hard on the eyes. Some think only of the renderer's pleasant task of sitting at the best window of the design or drafting room, painting "pretty pictures." Rendering is fun, in moderation, but the professional's life is all too often a perpetual *charrette,* nearly every job being a rush job. Again, though reasonably lucrative, rendering does not bring the fabulous fees that are sometimes rumored. Even such rare drawings as do run into "big money" require an enormous expenditure of time. And one cannot build up a business, as in many fields, with a body of profitable employees, but is forced to depend largely on his own efforts.

We therefore advise the reader ambitious in this direction either to combine rendering with other work, or to carry it on as a temporary expedient while preparing for something with a greater future. A majority of the best-known renderers, such as Otto R. Eggers and J. Floyd Yewell, are architects as well. Others who follow the rendering profession specialize also in the design of ornamental detail, in advertising drawing, in the teaching of architecture, or something of that nature. They are therefore not forced to rely wholly on a thing which, valuable as it is, is in variable and limited demand.

In conclusion, attention is called to our unusually diversified and abundant illustrations, both in Parts I and II. In addition to the numerous diagrams and sketches by the author (all the unsigned work is his) there is a wealth of full page examples—for the most part reproduced in full color—of the work of many leaders in this field. These form a veritable gallery of beautiful sketches and renderings, typical of the best in America today. Such of these illustrations as have appeared in *Pencil Points* over a period of some years take on an extra value here, for each, in addition to displaying its individual merits, serves as a direct illustration of some point or points brought out by the text.

To the artists who have so kindly loaned these works, and to all others who have contributed in any way towards the making of this volume, the author and publishers acknowledge their deep indebtedness and express their warmest thanks. Especially is credit due to Kenneth Reid, Managing Editor of *Pencil Points,* who not only bore the brunt of the labor of collecting these illustrations but whose advice and editorial assistance are evident on every page. And the author would appear ungrateful, indeed, not to recognize, in this connection, his debt to his good friend, John Floyd Yewell, for his generosity in writing the introduction to this volume and in contributing many illustrations to it, not to mention his numerous suggestions, freely offered, which have been incorporated in the text.

ARTHUR L. GUPTILL

Westways, Gorham, Maine *August, 1935*

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INTRODUCTION

Experimentation as a basis for the advancement of human knowledge has proved, on the whole, a reliable guide in the ever forward march of science, engineering, and even economics. It is safe to say that it has been largely responsible for the world's progress during the last few centuries. True, many of us have been misled by the apparent results of our experiments and have reached false conclusions through lack of proper guidance and through the intrusion of erroneous assumptions, incorrect observation, or imperfect understanding. But later experiments have always set us back on the right track and identified our errors.

Developments in science and engineering have for the most part been evolutionary, great minds in successive generations each contributing a part toward the attainment of the goal of perfection. Thus were the locomotive, the automobile, the airplane, the radio developed—and the end is not yet. But in any art, such as the art of water color painting, while we must also develop through experiment, there is an important difference. The artist, unlike the inventor, cannot take up where his predecessor left off or profit very much directly from the experience of another individual. The artist must start from the beginning and go through the whole range of experiments himself.

We read of J. M. W. Turner trying to do in his water color of Warkworth Castle what Richmond did in oil—sponging, wiping out, and scraping with a knife to produce an oil effect. Later on we find him painting in an entirely different manner, displaying in his work all the beautiful transparency of the medium with which he achieved such remarkable skill in representing effects of atmosphere and distance. He was ready to try any experiment which might promise to help him to interpret on paper, in the medium of water color, the vision of beauty he saw in nature. His finished works are there in our museums for all to see and enjoy. Sargent, Vignal, and many others who have followed have studied these paintings—but each of them has made his own experiments and has expressed himself in his own particular manner.

In the following pages, Mr. Guptill essays to guide the student of color painting into proper channels, following a well laid out plan of procedure which stresses the importance of experiment at every stage. The number, variety, and quality of the illustrations he has provided lend emphasis to this idea of experiment and make clear the need for the student to read carefully and practice each exercise in order that he may acquire the skill to express himself fluently in color in his own individual way. Thus is the book made valuable to those who would seek mastery over the ever entrancing medium of water color. The author has expressed to me his hope that his readers will, through performing these experiments and exercises, be led not only to an adequate command of the technique of water color but to an appreciation which will help encourage the further development of the art in this country. In my opinion his hope has an excellent chance of being realized.

JOHN FLOYD YEWELL

New York, N. Y. *November, 1935*

COLOR
IN SKETCHING AND RENDERING

PART I
THE ELEMENTS OF WATER COLOR PAINTING

FROM A WATER COLOR SKETCH BY MILLARD O. SHEETS

Showing a procession at Grauman's Chinese Theatre, Hollywood, California. Original, 10⅜" x 12⅜"

CHAPTER I

ON THE CHOICE OF ONE'S PIGMENTS

PRESENTING THE PALETTES OF PROMINENT ARTISTS

The scope of this volume is so great, and the requirements of our readers so diversified, that it seems advisable to present quite complete chapters on the selection, preparation, and care of the necessary equipment.

WATER COLOR PAINTS These are of two common kinds, generally termed "transparent" and "opaque." For typical water color painting the former are employed: we speak of them merely as "water colors" or "water color paints." Opaque pigments are known under such titles as "opaque water colors," "poster colors," "show-card colors," "mat colors," "body colors," "tempera," and "gouache."

Inasmuch as a large percentage of representative painting in water color is done with transparent pigment, it will be our main consideration here. Only in Chapter XXVII will we have much to say about opaque color.

A STANDARD MAKE One should employ from the first only high-grade pigments of standard make. He will find them dependable and readily available the country over. Price is usually a fair indication of quality.

CAKES, PANS, OR TUBES? The beginner often purchases his colors as part of a students' painting set which includes box and brushes. If of good quality, and well chosen as to hue, this is satisfactory. Figure 1 shows a typical student's outfit. Sets with approximately twelve colors are popular. Refills are available.

Although there are similar fitted boxes of better quality for the advanced student or professional, he usually prefers to select individual pigments. These are obtainable in many forms, including small jars or bottles; cakes (or "buttons") of numerous shapes and sizes; pans of glass, porcelain, or metal; sticks from which the color can be rubbed; papers coated with soluble pigments; jars of pigment in powdered form (mainly for poster work), and collapsible tubes. Of these the cakes, pans, and tubes are the more common. Some prefer one and some another. Cake and pan colors are satisfactory if sufficiently soluble. They are at their best if one paints only occasionally or uses little pigment at a time. A drawback is that they are often too hard. Again, they become daubed or saturated with other hues. Tube colors are moist (though they sometimes harden with age), insuring a fresh, pure supply, as needed, and permitting the rapid mixture of large amounts of wash. Taken all in all, they are perhaps the most desirable.

SIZES Cakes, pans, and tubes are available in different sizes. The Winsor & Newton range is typical, as suggested by Figure 2. This company also provides large "studio" tubes. One can thus purchase quantities suited to his requirements.

NUMBER OF COLORS The manufacturer frequently lists a hundred or more colors. This is bewildering, so we offer definite selections or "palettes" below to guide the buyer until such time as he develops personal predilections. These palettes vary greatly in number of

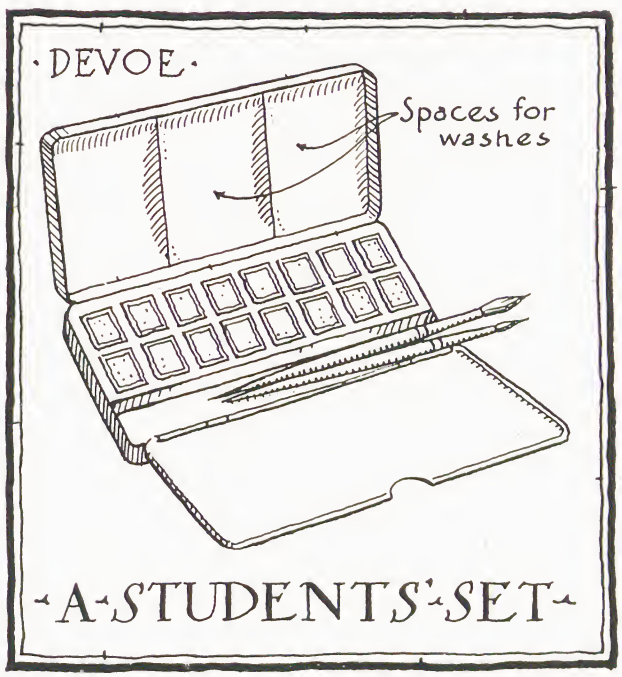


FIGURE 1

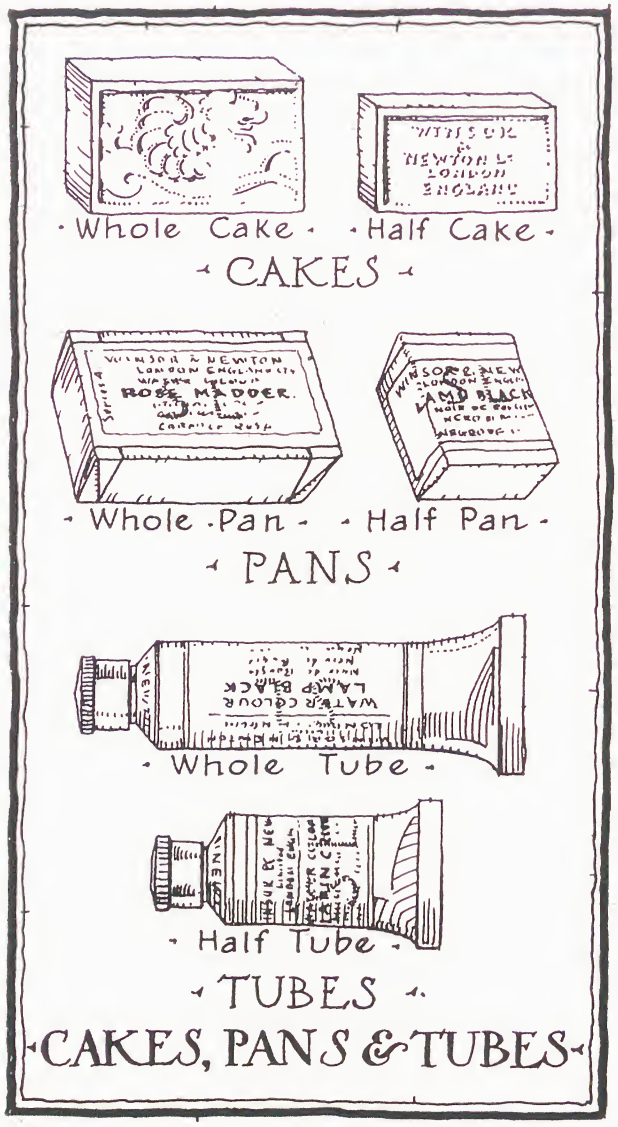


FIGURE 2

colors. Though beautiful paintings can be made with merely the three primaries, red, yellow, and blue, these are usually supplemented (even in student sets) with the secondaries, orange, green, and violet, plus brown and perhaps black and white. The author is inclined to urge the mature student, whether a beginner or not, to go beyond this total of nine, buying at least twelve or fifteen hues; for many purposes twenty or more are better. If one needed only a full gamut of color, a few basic pigments would give it through admixture (see Chapter IX). The artist, however, seeks to represent not only the hues of the objects depicted, but such textural characteristics as smoothness and roughness. He tries also to interpret vague things like the scintillation of sunshine and the vibration of atmosphere. He therefore chooses his colors accordingly. Some pigments contain sediment which produces a granular quality. Some so dye the paper that interesting effects are obtainable through scrubbing. Some, in mixture with others, tend to separate, giving unique results. Such peculiarities help him to express the endless variety and complexity of nature: with too limited a palette he is handicapped.

PERMANENCE Some pigments are far less durable than others, causing paintings to darken, fade, or discolor with age. They should therefore be avoided altogether or used sparingly, or on minor works. This does not mean that the artist must know color chemistry, for many manufacturers make available, on request, full descriptions of their products. Winsor & Newton, for example, list three groups of colors, one absolutely permanent, one moderately durable, and one fugitive. From these they recommend a "Selected List" of colors which are both non-fading and mutually inactive chemically—foolproof, in other words. Each color in this list is stamped S. L. (in red) for instant identification. See Figure 2.

SPECTRUM COLORS Several makers offer sets of extremely brilliant pigments, usually graded or arranged to simulate the solar spectrum. Whereas these bright, clear colors are ideal for certain purposes—as in making color charts or painting vivid flowers, sunset effects, etc.—the student should employ them, if at all, only to supplement his regular colors. They should not be substituted for them, as they are of limited use in most representative painting, where one's normal task is to portray the somewhat neutral tones of everyday objects. It takes time and skill to dull them for this purpose; they generally lack, too, the desirable sediment already mentioned.

PALETTES What one needs, then, is a well-balanced palette. These below, contributed by prominent artists, should help in making a selection.

VERNON HOWE BAILEY To this noted artist, whose paintings on pages 132, 324, 325, and 326 are brilliant illustrations of aquarelle, we are indebted for the following list:—

Reds and Oranges	1. Alizarin Crimson
	2. Vermilion
	3. Burnt Sienna
Yellows	4. Yellow Ochre
	5. Cadmium Yellow, Deep
Greens	6. Viridian
	7. Hooker's Greens

Blues	8.	Ultramarine
	9.	Cobalt Blue
	10.	Cerulean Blue
Brown	11.	Vandyke Brown

ERNEST BORN On pages 138, 139, 329, and 330 are reproductions from the brush of this gifted master of many media. He also sends us the following:—

"Here are the colors I usually work with, although I seldom employ more than six or eight at one time on the palette. These depend on the subject, and whether the work is done in the studio or outdoors.

Reds and Oranges	1.	Alizarin Crimson
	2.	Light Red or Mars Orange
	3.	Burnt Sienna
Yellows	4.	Yellow Ochre
	5.	Cadmium Pale (any fine make except Winsor & Newton)
	6.	Raw Sienna or Mars Yellow
Greens	7.	Viridian
	8.	Terre Verte
Blues	9.	French Ultramarine
	10.	Cobalt Blue
	11.	Cerulean Blue
Brown	12.	Raw Umber
Black	13.	Black

"In general I use Winsor & Newton colors, with the one exception noted above, although I believe any of the fine English, French, or German colors to be equally good. Winsor & Newton, the original inventors, are still preeminent as makers of Chinese White.

"The 'Horadam' colors of Schminke are particularly valuable for certain types of work requiring utterly transparent and superbrilliant effects. They are treacherous to use with regular colors, since their extreme brilliancy tends to put everything else out of key. These are aniline colors and seem to be absolutely permanent, as the makers claim them to be.

"Among the publications on pigments, I have found the following of great value. These all deal with pigments in general, but anyone seriously interested in any phase of painting would find them well worth study.

Sir Arthur Church, *The Chemistry of Paints and Painting* (London, 1901)

A. P. Laurie, *The Painter's Method and Materials* (J. B. Lippincott Co., 1926)

F. W. Weber, *Artists' Pigments, Their Chemical and Physical Properties* (Van Nostrand, 1923)

Maximillian Toch, *Paint, Paintings, and Restoration* (Van Nostrand, 1931)

Maximillian Toch, *Materials for Permanent Painting* (Van Nostrand, 1923)

"Winsor & Newton, Blockx, Rembrandt, and others publish well prepared brief treatises on pigments, which are singularly free from trade prejudice."

PAUL PHILIPPE CRET Professor Cret, representative examples of whose work we show on pages 141 and 169, has so exceptional a reputation that we are sure his palette will be of the greatest interest. He says: "The palette of water colors I use is as follows:—

Reds and Oranges	1.	Indian Red
	2.	Venetian Red
	3.	Vermilion
	4.	Carmine
	5.	Burnt Sienna
Yellows	6.	Lemon Yellow
	7.	Aureolin Yellow
	8.	Indian Yellow
	9.	Pale Chrome Yellow
	10.	Cadmium Yellow
	11.	Naples Yellow
	12.	Yellow Ochre
	13.	Raw Sienna
Green	14.	Emerald Green
Blues	15.	French Blue
	16.	Cobalt Blue
	17.	Cerulean Blue
	18.	Prussian Blue
	19.	Antwerp Blue
Brown	20.	Brown Madder
Black and White	21.	Peach Black
	22.	Chinese White

"Most of these colors are transparent; the more opaque ones are helpful toward the end of a rendering."

HUGHSON HAWLEY Here we have a message from the dean of American architectural renderers, who contributed the amazingly complete and exact subjects on pages 111, 186, and 215. He says:

"My palette has always been composed of Winsor & Newton's colors—they *never* fade.

Reds and Oranges	1.	Light Red
	2.	*Indian Red
	3.	Vermilion
	4.	*Crimson Lake
	5.	Burnt Sienna

Yellows	6.	Yellow Ochre
	7.	Cadmium Yellow
	8.	*Light Chrome Yellow
Greens	9.	Emerald Green
	10.	Viridian
Blues	11.	French Blue
	12.	Cerulean Blue
	13.	*Prussian Blue
	14.	Indigo
Browns	15.	*Vandyke Brown
	16.	Sepia
	17.	Brown Madder
	18.	Brown Pink
Black and Gray	19.	*Lamp Black
	20.	*Neutral Tint

"These are the dry cakes which I keep moistened, that way being purer. Those marked with an asterisk I use only occasionally.

"A rule to produce effective work—*Put the right color in the right place and success is assured.*"

JOHN FLOYD YEWELL Yewell's many admirers will not only be glad to see the numerous delightful sketches and renderings from his hand which embellish our volume (see pages 162, 163, 179, 237, 264, 265, 266, 268, and 295), but will welcome his palette. He experiments constantly, varying his palette from time to time. He names the following Winsor & Newton tube colors as his present favorites:—

Reds and Oranges	1.	Rose Madder
	2.	Vermilion
	3.	Cadmium Orange
	4.	Burnt Sienna
Yellows	5.	Aureolin
	6.	Raw Sienna
	7.	Yellow Ochre
Blues	8.	French Blue
	9.	Cobalt Blue
	10.	Antwerp Blue
Green	11.	Emerald

OTTO R. EGGERS On page 180, in describing one of Eggers' superb productions, we offer the present palette of this distinguished designer-renderer, along with his description of the method he just now employs. The reader should also study his drawings on pages 166, 167, and 280.

THE AUTHOR Here the writer ventures to present his own palette, made up of tube colors:—

Reds and Oranges	1.	Alizarin Crimson
	2.	Rose Madder
	3.	Vermilion
	4	*Chrome Orange or Cadmium Orange
	5.	Burnt Sienna
Yellows	6.	Aureolin
	7.	Yellow Ochre
	8.	Naples Yellow
	9.	*Gamboge or Cadmium Yellow
	10.	Raw Sienna
Green	11.	*Emerald Green
Blues	12.	French Blue
	13.	Cerulean Blue
	14.	Antwerp Blue
	15.	Cobalt Blue
Browns	16.	Sepia
	17.	*Vandyke Brown
Black and White	18.	Ivory Black
	19.	Lamp Black
	20.	Chinese White

**These are not on the Winsor & Newton selected list and are employed with caution.*

It is seldom that more than eight or ten of these are needed for a single drawing.

OTHER SUGGESTIONS Numerous additional suggestions will be found scattered throughout the volume. See, for example, Chapter XV, Part I. The index points to others. For palettes of opaque colors, see Chapter XXVII.

Note. It is by mere coincidence that the Winsor & Newton colors receive so much attention in this chapter. It is not the author's intent to prejudice the reader in any way. Like Born, he feels that a number of other makes give equal satisfaction.

CHAPTER II

ADDITIONAL ITEMS OF EQUIPMENT

BOXES, BRUSHES, TABLES, AND LIKE ACCESSORIES

With the choice of one's colors settled, he can turn to other items of equipment.

COLOR BOX First in line comes the color box, a thing which, while not indispensable, is of great convenience.

Most boxes are "made of japanned tin, black without and white within." They may be purchased empty or "fitted." The school boxes (Figure 1) are usually of the fitted sort, provided with inexpensive paints and brushes. What interests us more just now is a type which will accommodate high-grade pigments such as were recommended in Chapter I.

For tube colors, the general style shown in Figure 3 is excellent, though this thirty-color box is unnecessarily bulky. One to accommodate eighteen or twenty-four hues is usually better. For half tubes a much smaller box will do. Note that the cover slides from the top and opens to form a palette, with thumbhole. Another palette box is sketched at 2, Figure 4; this makes no provision for storing the tubes. A similar type reverses this arrangement, with stalls in the cover.

For pan colors, Figure 4 shows, at 1, a suitable box. This, like many palette boxes, is manufactured in both right-hand and left-hand styles.

For outdoor sketching the same box generally does, though a small one, like that in Figure 55, page 124, can prove extremely handy, slipping into the pocket.

PALETTE If one employs tube colors, a separate palette (Figure 5) is often useful. An ordinary dinner plate (Figure 6) is practical. Either of these is at its best when paint is to be dabbed on, or mixed freely on the palette or the paper instead of being applied in large previously prepared washes.

"SETTING" THE PALETTE One's pig-

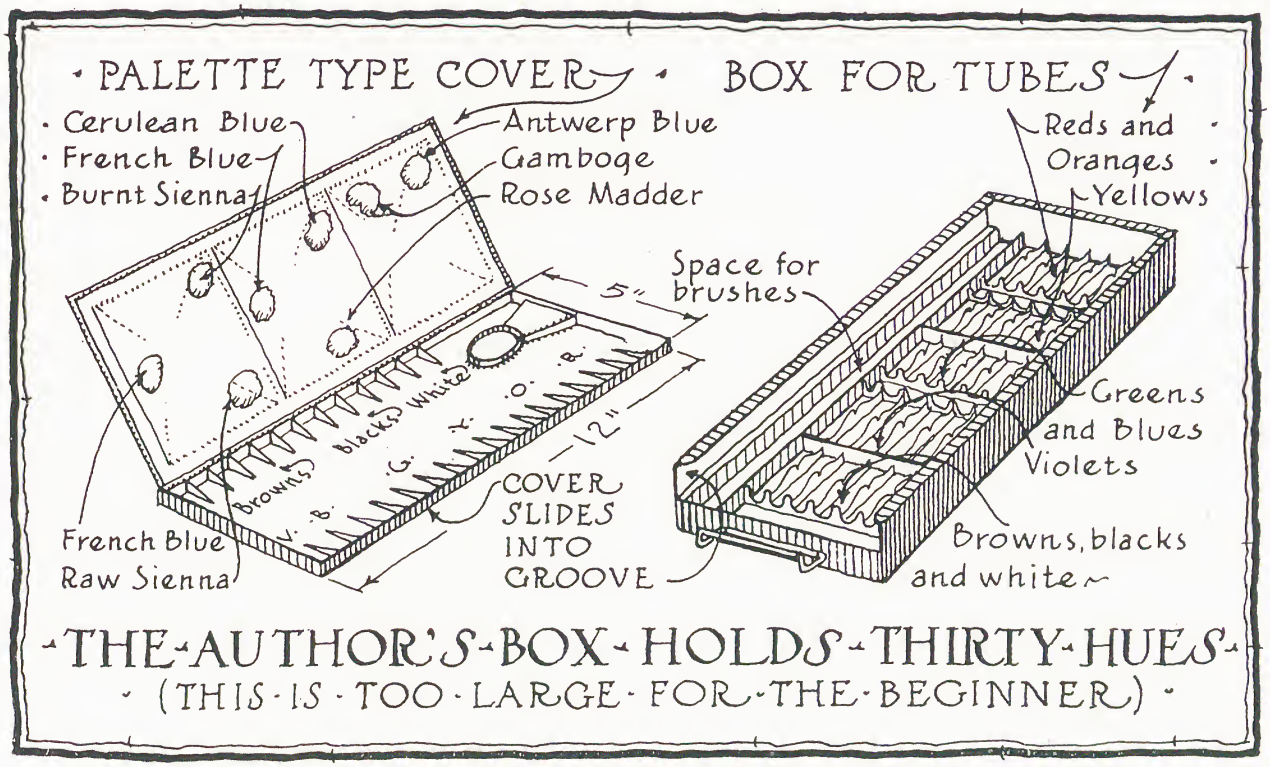


FIGURE 3

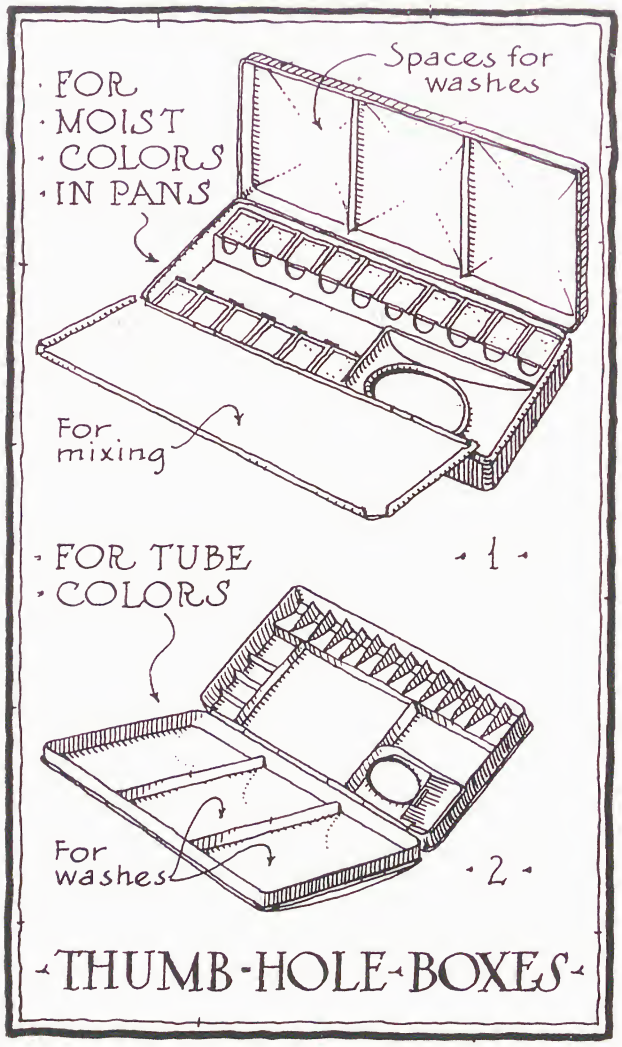


FIGURE 4

ments, whether pan or tube, should be systematically arranged both in box and palette. A common arrangement is based on the spectrum; see Figure 3. The reds come first, then the oranges and yellows, next the greens, blues, and violets, and finally the browns, blacks, and whites. As one gains in experience he may choose to group colors which he frequently uses in combination; note the palette cover, Figure 3. In another scheme, two major groups are arranged; the first consisting of colors which insure smooth, clear washes, and the other the heavy, deposing ones. As tube white dries quickly, it is best to squeeze it out only as needed.

WHEN TUBE CAPS STICK Dipping an obstinate cap in water (preferably hot) for a moment will generally loosen it. Heating with a match will do the same thing even more effectively. Keeping screw threads clean will do much towards preventing this difficulty.

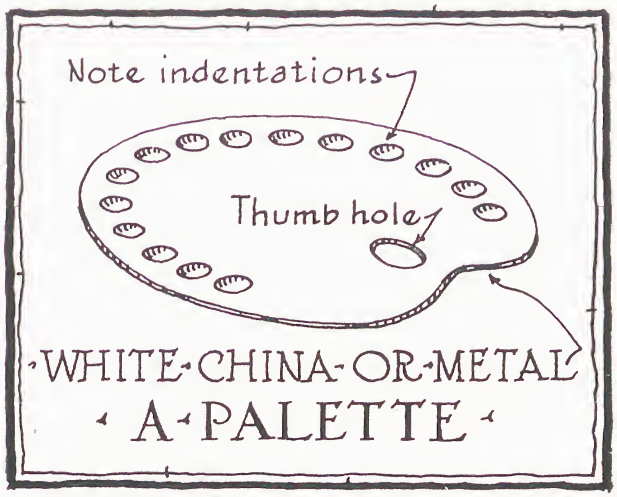


FIGURE 5

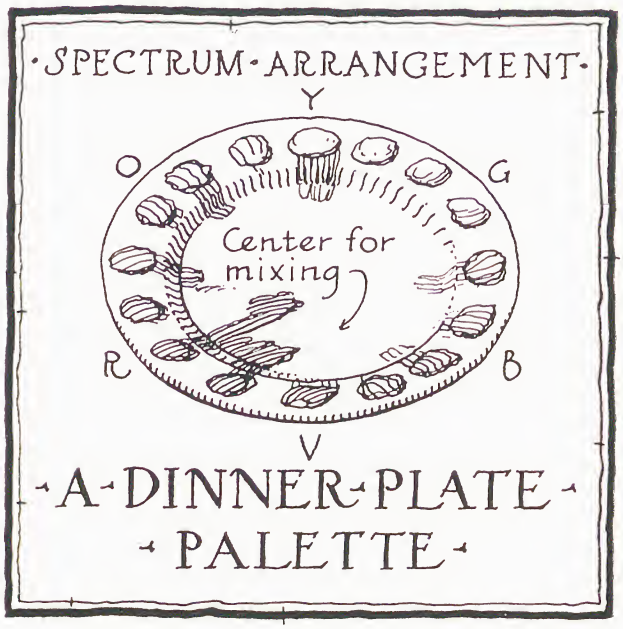


FIGURE 6

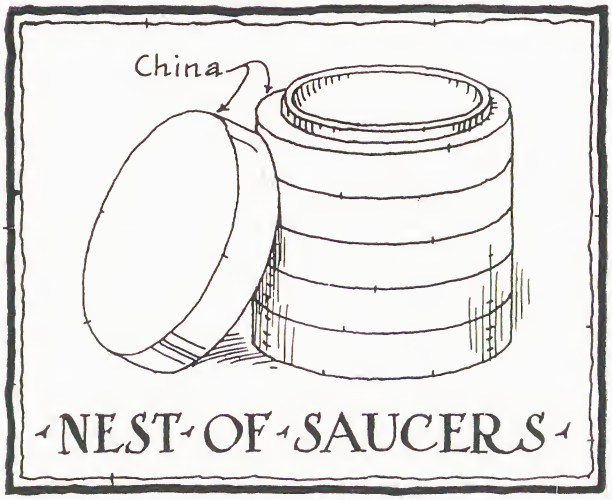


FIGURE 7

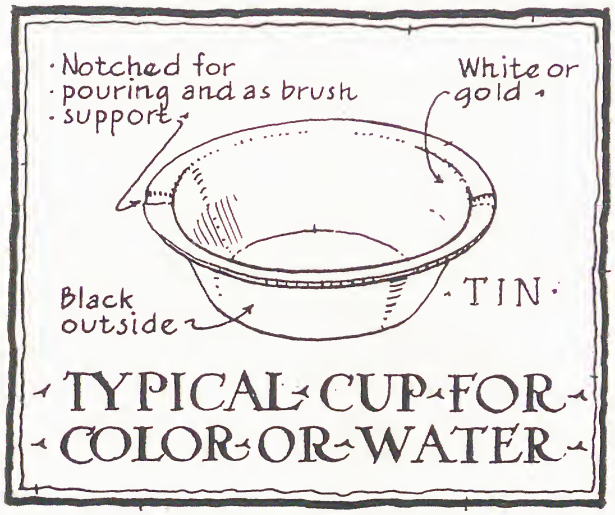


FIGURE 8

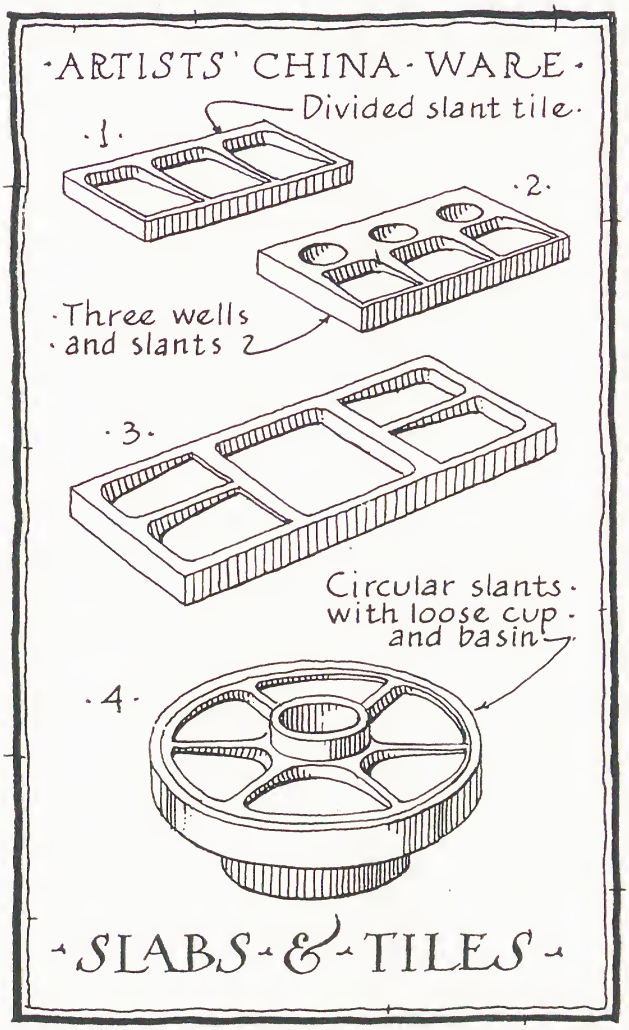


FIGURE 9

SAUCERS, SLABS, ETC. There are many kinds of vessels (in addition to color boxes and palettes) in which pigment is mixed. Among the most useful are the china saucers

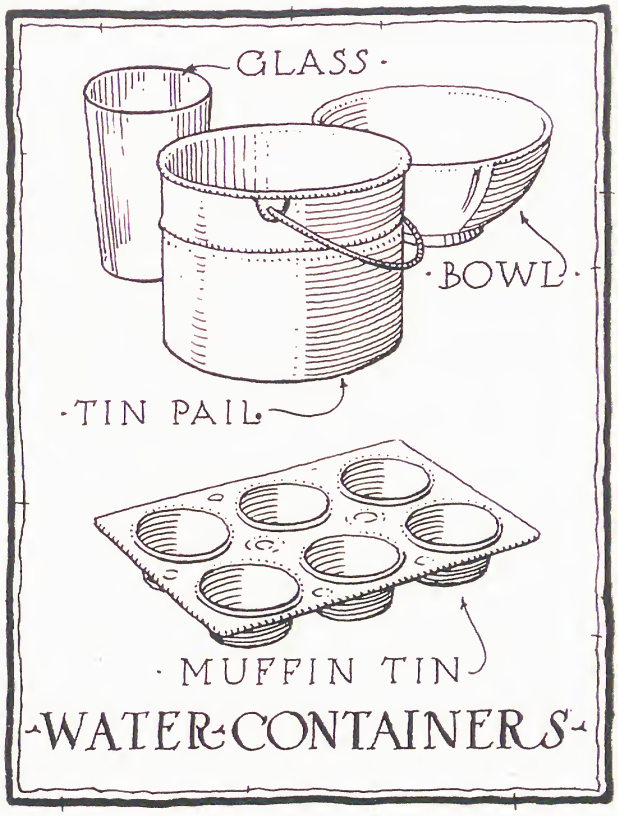


FIGURE 10

("godets," as the French have it) pictured in Figure 7. They take little room, and can be "nested" with washes in them, preventing evaporation. Figure 8 pictures a type of tin cup which is inexpensive and practical; its width is approximately three inches. For small amounts of wash the regular artists' tiles and slabs (Figure 9) do very well; many of them contain more "wells" than our sketches show. Muffin tins, as in Figure 10, are extremely popular, both for mixing large washes and as water containers. For the former purpose they are improved by lacquering with white, permitting true color judgment. For unusually large washes, regular cups, sauce dishes, or bowls are ideal.

WATER CONTAINERS These latter utensils are also excellent for storing the necessary supply of water. Little tin pails (Figure 10) are all right, too, as are drinking glasses. For outdoor sketching, bottles or flasks prove less bulky, though they tip rather easily. Figure 57, page 124, shows a container especially made for the artist. Note also the practical brush case.

BRUSHES Brushes are of great importance. Cheap ones are occasionally satisfactory but on the whole are of doubtful value. So, as one

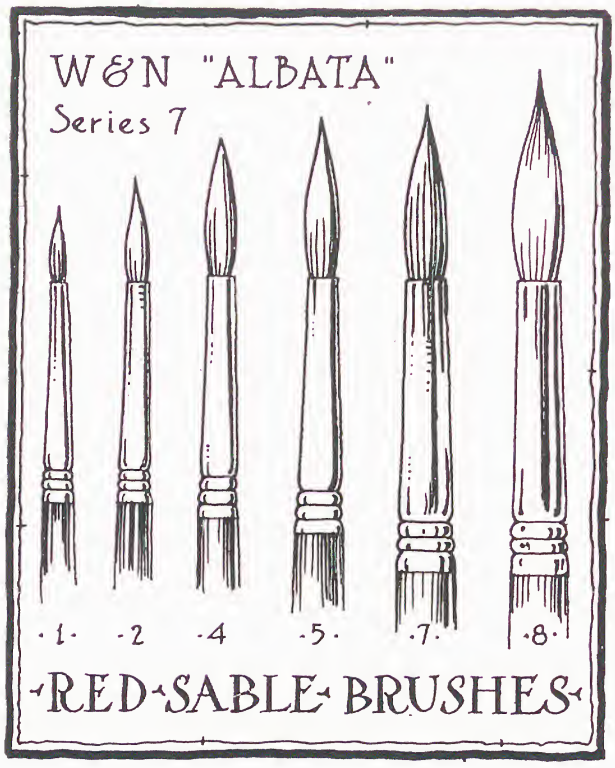


FIGURE 11

needs but few, he should afford the best. Those of red sable hair are generally so considered. The round, sharply pointed type pictured in Figure 11 is probably the most popular, though for many purposes flat ones with square points (Figure 12) are more convenient. In painting buildings, for example, a rectangular space such as a door or window shutter can often be done in a single stroke. The author's favorite sable brush, just now, is a flat one of ¾″ width.

Whether round or flat, test each brush before you buy it. Wet it thoroughly. Shake it. Slat it. Does it look well made? Does it hold its point even with most of the water jarred out? Does it seem springy and responsive as you draw it across the paper, or dead and flabby? If not right, reject it.

Unless a new brush has been injured (as by moths) the hairs should be firmly embedded. If an old brush starts "molting," it can sometimes be cured by hammering the ferrule.

As to round brushes, one generally needs about three—small, medium, and large; for work like architectural rendering a huge one is also convenient. It is best to use, for any given piece of work, the largest size practical. Small brushes require too frequent dipping and lead one into finicky ways. As methods of grading sizes vary, we show in Figure 11, in order to offer something tangible, full-sized sketches of a group of Winsor & Newton brushes. Three or four of this general type should prove sufficient. For tiny work the smallest two are good: Nos. 4 and 5 are excellent for detail or complete small drawings: Nos. 7 and 8 are just right for the bulk of the work on what we might call "average" drawings. For bold sketching (such as outdoor work) and for laying large washes (as on skies and backgrounds) so big a tool is needed that one sometimes feels forced to substitute for sable something cheaper, such as imitation sable, camel hair, or squirrel. The No. 17 camel hair "dabber" in Figure 13 lists at less than a dollar in contrast with the ten or fifteen dollars that a sable brush of this size would cost. The Keuffel and Esser brush in the same sketch is also relatively inexpensive. If imitation sable brushes are selected, on the ground of economy, those most closely approximating sable are considered the best. Camel hair brushes lack spring and seldom hold their points well; hence they are not recommended except in the large sizes used for bold work.

BRISTLE BRUSHES For certain types of work, and particularly for scrubbing out high-

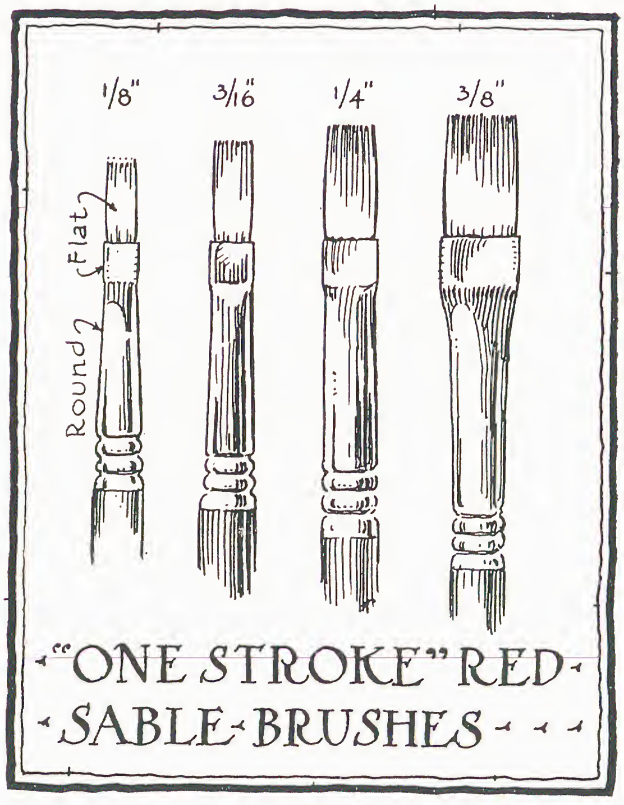


FIGURE 12

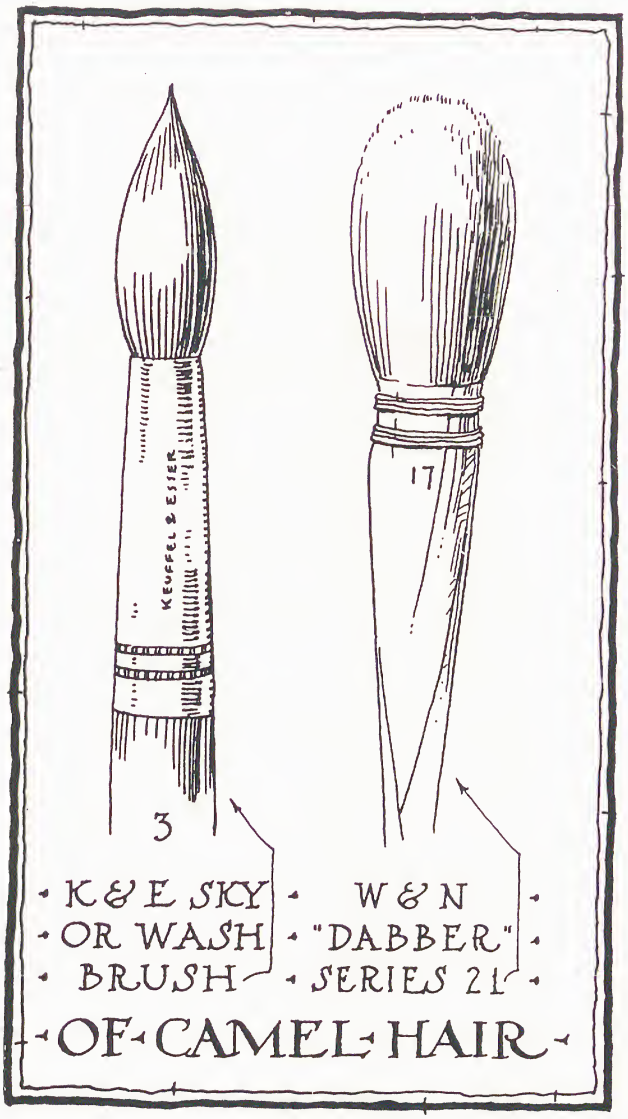


FIGURE 13

lights, stiff bristle brushes are sometimes selected—see Figure 14.

CARE OF BRUSHES With proper care, good brushes will give years of service. Rinse yours frequently, as you use them, and wash them thoroughly when you put them away. Don't leave them standing for long periods in paint or water: don't allow them to dry in cramped positions. Don't try to soften hard cakes of paint by scrubbing them with your best brush!

DRAWING TABLES For typical water color work, easels are seldom employed. For an exception, see Chapter XVIII. The best support is one which holds the paper, usually attached to a drawing board as later explained, in an almost horizontal position at convenient height. An ordinary table or stand will do. The student, seated, can work with the board

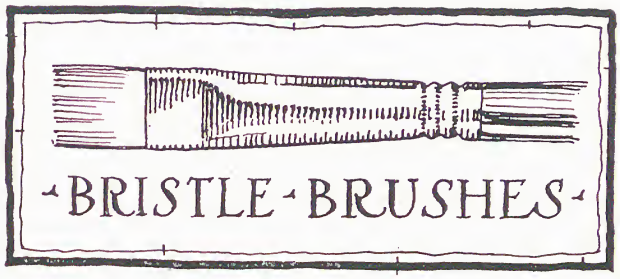


FIGURE 14

held in his lap and slanted to rest against the table—or, better, it can be laid on top, pitched slightly by means of a book or block beneath the further edge. Some prefer a higher table so that they can paint standing, or on a stool.

Quite ideal is the adjustable table shown in Figure 15. The top can be placed at any height and angle. Figure 16 illustrates a somewhat larger but less expensive type. Both can be used standing or seated; both store away in comparatively small space. Also handy and inexpensive is the adjustable tilt board, a back view of which is shown in Figure 17: this can be placed on any table.

For the professional artist (including the architectural renderer) who does large work, the combination drafting table and cabinet,

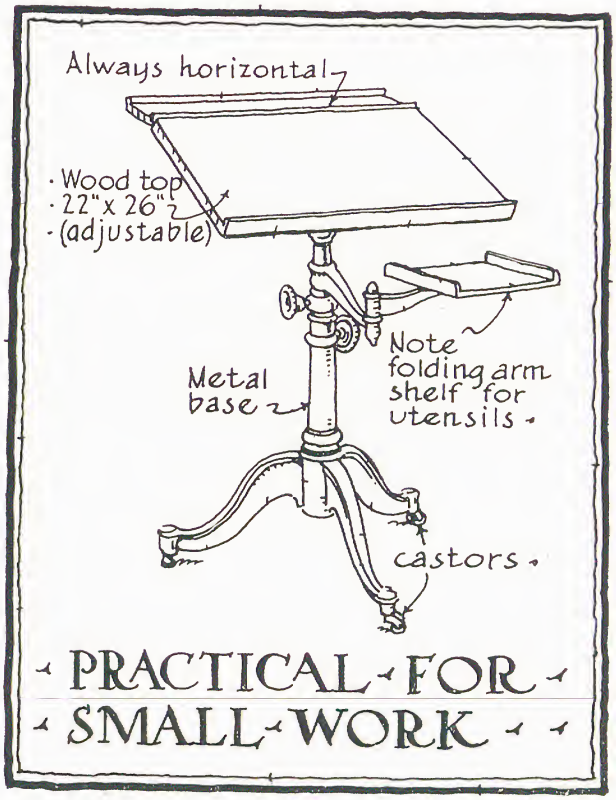


FIGURE 15

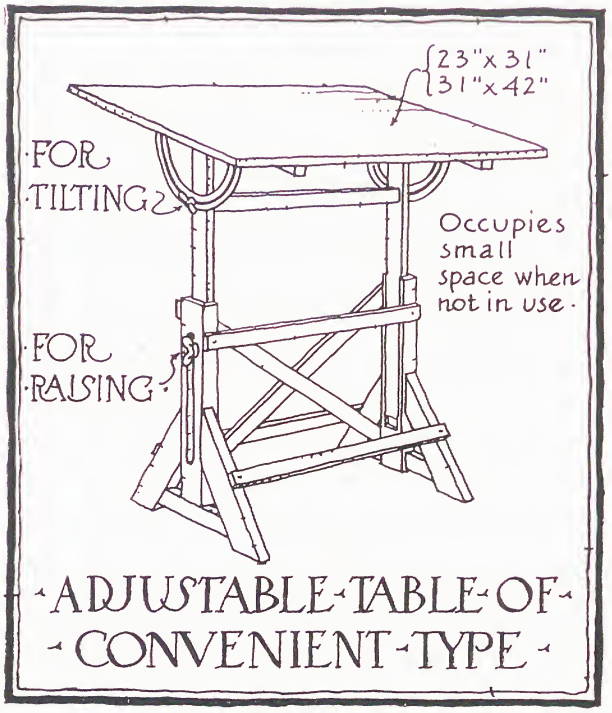


FIGURE 16

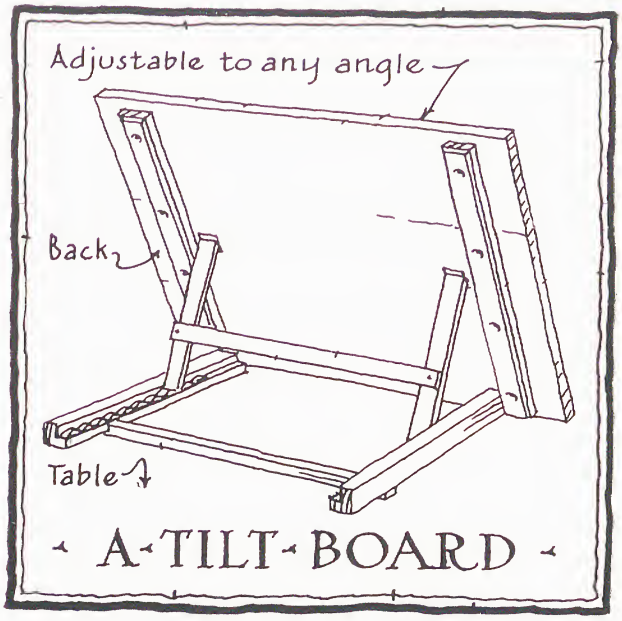


FIGURE 17

Figure 18, is just the thing. The sketch is self-explanatory excepting at *A*, where a swinging arm with instrument shelf could be added. An adjustable stool is a fitting companion piece.

As this kind of table is bulky and expensive, the renderer often substitutes a large drawing board supported by a pair of horses: note the adjustable type, Figure 19. The board may be pitched slightly, or left flat, in which case the rendering is done on another board laid on top, blocked up the necessary five or ten degrees.

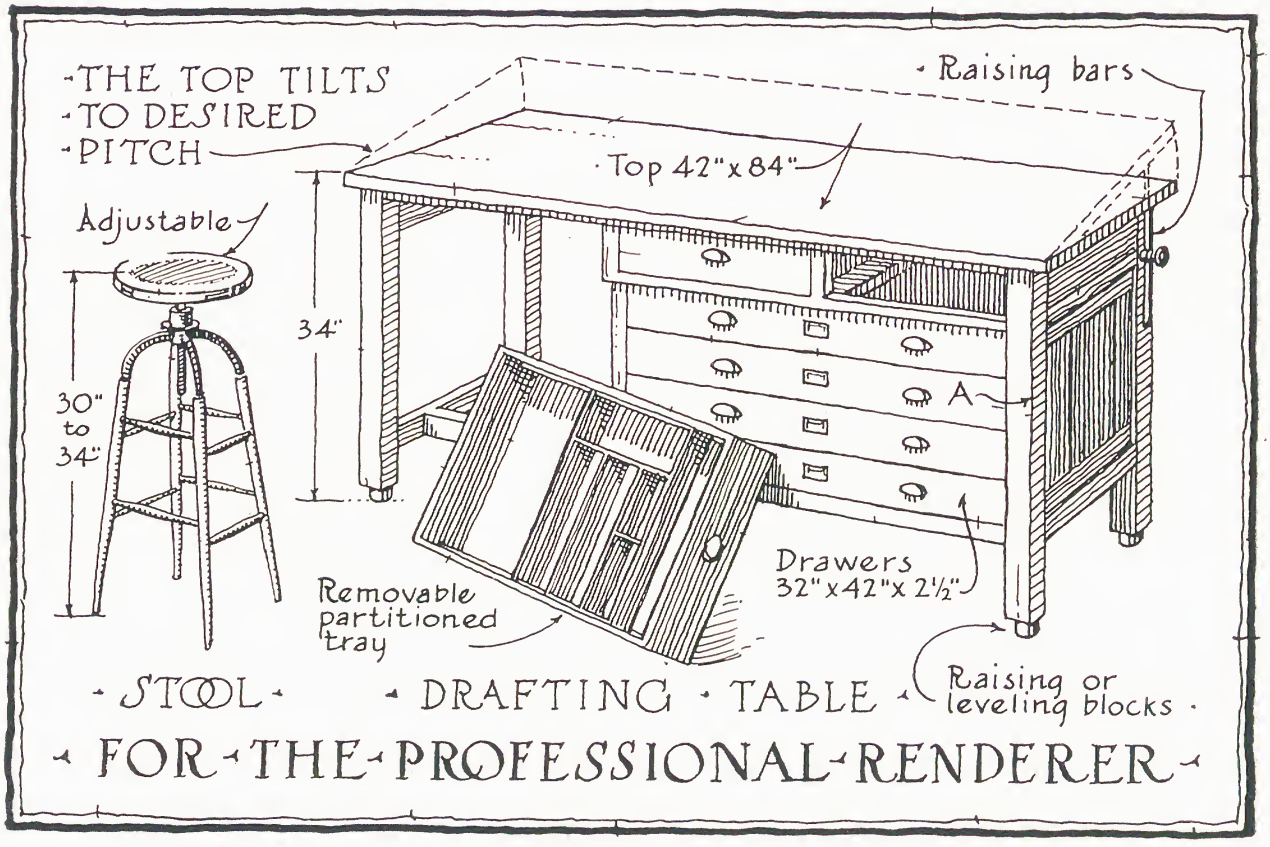


FIGURE 18

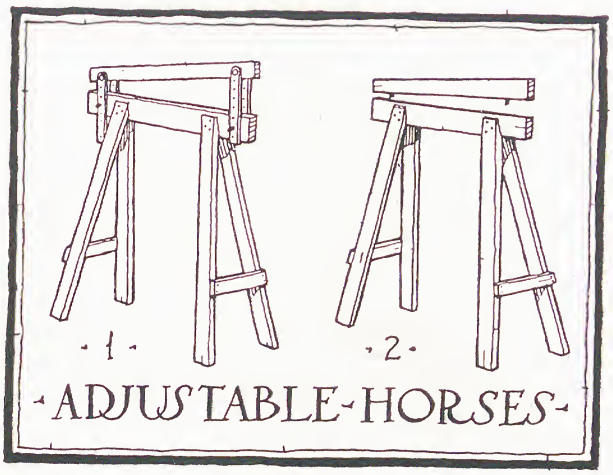


FIGURE 19

CABINET Figure 20 pictures a handy cabinet for materials. Such a cabinet is frequently used in conjunction with a table of the type shown in Figure 15.

DRAWING BOARDS The drawing paper, discussed in the coming chapter, is usually fastened to a regular wooden drawing board. Several are convenient, the sizes depending on the uses for which they are intended.

DAYLIGHT LAMP One's work must be well illuminated at all times. Daylight is best if coming from the north, being relatively clear and steady. If from the left, disturbing shadows from hands and instruments are prevented. For work after dark, a "daylight" lamp should be so placed as to simulate the day lighting. The author has several of the type shown in Figure 21: a single one does quite well for most purposes. Their cost was low.

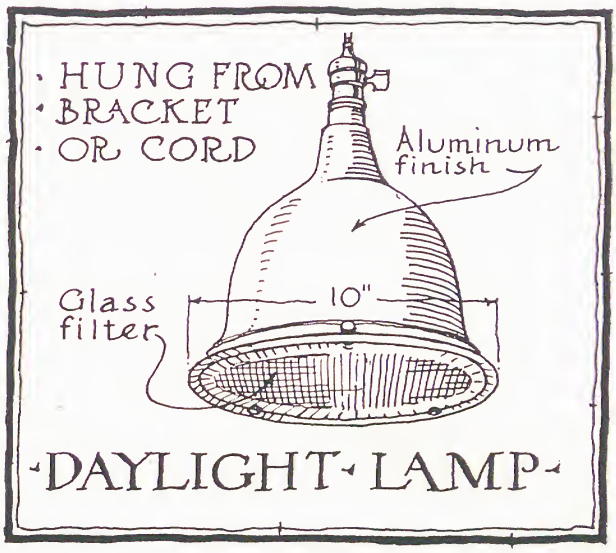


FIGURE 21

BLOTTERS Have plenty of blotters within reach. Set your color cups on them: keep one under the hand to protect the paper: touch your overcharged brush to them until just right: grab them in emergencies.

DUST BRUSH Dust your paper frequently. Particles of dirt, especially if of sooty or linty type, can cause real trouble. See Figure 22 for a handy style of brush.

FIGURE 22

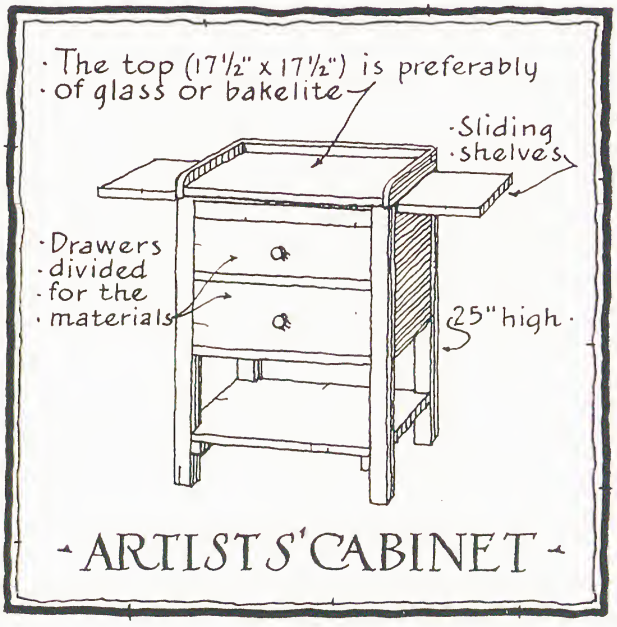

The top (17½" x 17½") is preferably of glass or bakelite
Sliding shelves
Drawers divided for the materials
25" high
ARTIST'S CABINET

FIGURE 20

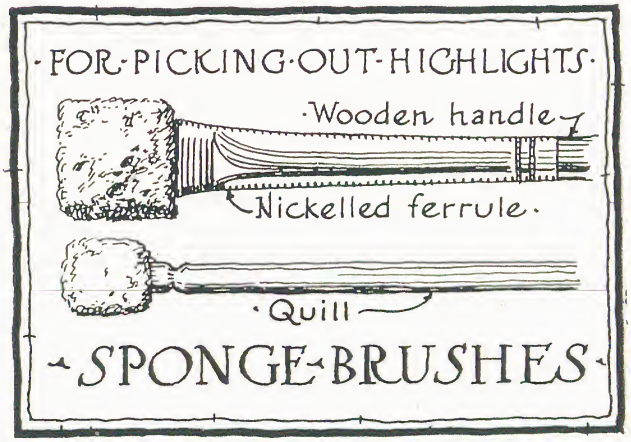


FIGURE 23

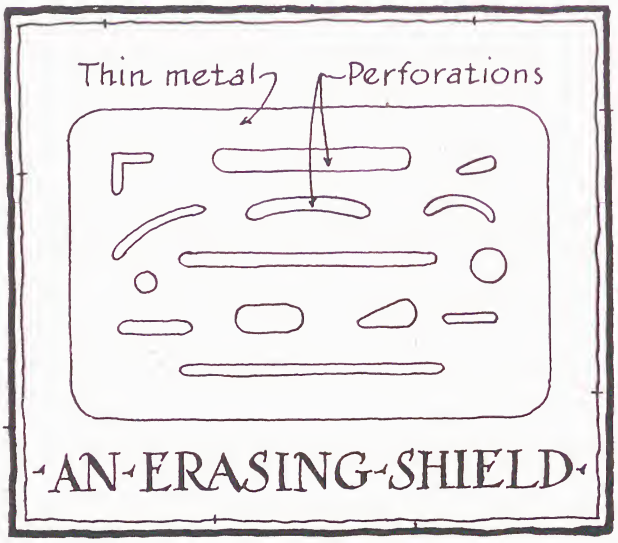


FIGURE 24

SPONGE A sponge is essential—not only for mounting paper, but for lightening tone, removing offending areas, and, on occasion, for applying pigment. Sponge brushes (Figure 23) are also used occasionally for applying pigment, or for scrubbing out highlights. They can scarcely be classed as essentials.

RAGS Paint cloths (cheesecloth is good) are employed by some artists much as blotters are by others. In the type of work where pigment is dampened and "wiped out" to form lights, the cloth often becomes an important instrument.

PENCILS: PENCIL POINTERS A half-dozen drawing pencils of various degrees are necessary. Special pencils will be described as we go on. For pointing, a draftsman's sandpaper scratch pad is desirable.

DRAWING INSTRUMENTS Most renderers of serious projects make considerable use of their regular drafting instruments. We presuppose our architectural reader is familiar with them and their employment. The artist often finds T-square and triangles helpful, or at least an ordinary ruler or straight edge.

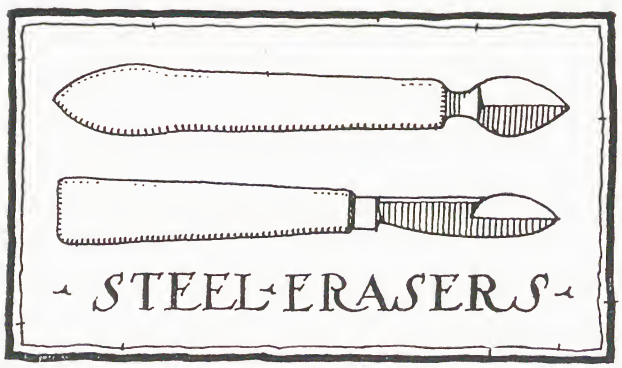


FIGURE 25

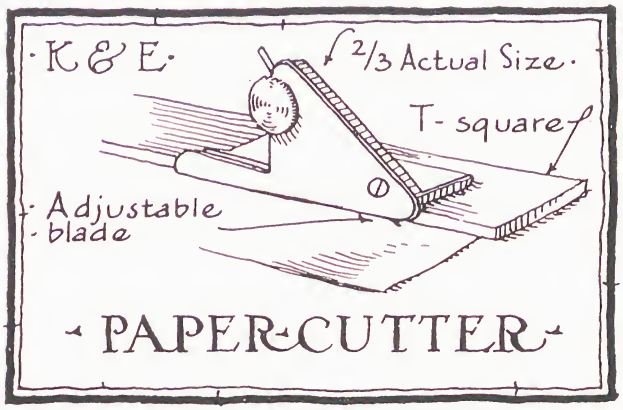


FIGURE 26

ERASERS: ERASING SHIELD The eraser plays an important part in lightening tones, picking out highlights, etc., to say nothing of its use in making corrections and cleaning the sheet. One requires several of different types.

Particularly valuable is the erasing shield, as it limits the areas erased. The draftsman's style is best (Figure 24) with its openings of many shapes and sizes.

The "steel" eraser (Figure 25) or a sharp penknife is another aid worth having.

KNIVES AND PAPER CUTTERS A paper cutter (Figure 26) fills a real need when it comes to removing stretches from the board, trimming drawings, etc. A knife may be substituted, of course. Scissors, too, are handy.

A sturdy knife for cutting mounted paper or heavy mat stock (Figure 27) is helpful, too, as are some of the devices which make use of discarded razor blades.

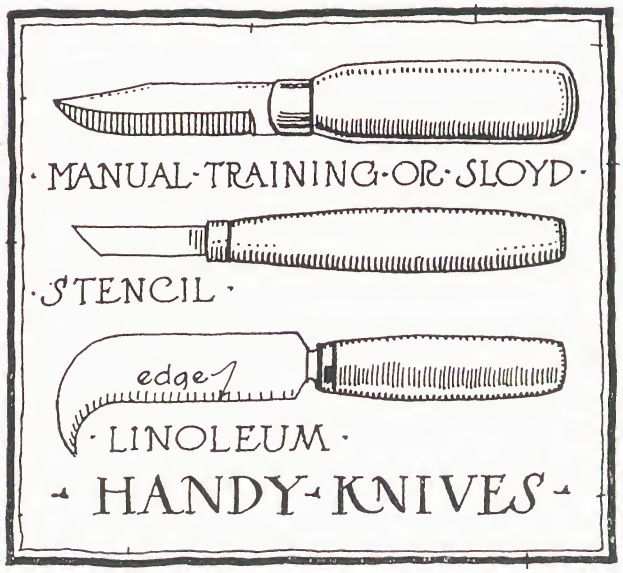


FIGURE 27

CHAPTER III

PAPER: ITS VIRTUES AND ITS FAULTS

KINDS, SURFACES, WEIGHTS, SIZES, COLORS, ETC

The papers generally used for water color painting differ in many important respects. They are white or colored; rough or smooth; absorbent or non-absorbent; light or heavy in weight; hand-made or machine-made. They are of pure rag stock, and so will prove durable, or of cheap stock which will cause them to discolor or otherwise deteriorate.

Paper not meant for the artist or which is primarily intended for other media is sometimes employed for water color work, particularly colored paper. Naturally its quality varies greatly. The use of paper which is far off the white should preferably be postponed until one has fair mastery over the white. It is on the customary white papers that we shall place our present emphasis. In Chapter XXVII, and in scattered references elsewhere, colored papers will be considered.

The most desirable papers are usually hand-made and imported, particularly from England. Of the English papers, "Whatman," "R. W. S.," "Arnold," "A. C. M.," "Crisbrook," and a number of others, are excellent, having many points of similarity.

WHATMAN PAPER Whatman is probably the best known imported paper in America, and the easiest to obtain. We shall describe it quite fully as it seems a sort of standard by which others are judged. It comes in a variety of surfaces, sizes, and weights, both in white and in tints. It is capable of standing a surprising amount of scrubbing, erasing, etc., and deteriorates little with age.

SURFACES The surface known as "cold pressed" or "C. P." (or in England "not pressed") is perhaps the best for all-around work. It has considerable roughness or inequality of surface (grain) yet not enough to prove troublesome. One can draw on it easily, even instrumentally.

Where much instrumental drawing is involved, as in architectural rendering, the smoother surface known as "hot pressed" or "H. P." is popular. It is also excellent where extremely fine brush work is concerned, though perhaps less sympathetic to larger washes. It seems to show erasures or surface injuries more plainly than the cold pressed.

A third surface called "rough" or "R" is splendid for bold effects. Being heavily grained, it is ideal for the "dry brush" technique elsewhere described. It is in demand for outdoor sketching.

SIZES Whatman comes in many sizes. The largest sheet is the "Antiquarian," measuring about 31″ x 53″. Another large sheet more commonly stocked is the 27″ x 40″ "Double Elephant." A popular size, the "Imperial," approximates 22″ x 30″: this is convenient for many renderings, while in halves or quarters it lends itself nicely to sketching.

WEIGHT More important than size is weight (thickness), and thin papers should generally be avoided, especially for large work. They buckle when wet—"cockle" is the English term—and if stretched (see next chapter) are inclined to split. To indicate the wide range, the Imperial size is available in six weights, varying from a light "72 lb." to an extremely heavy "300 lb." Unscrupulous dealers sometimes sell the light paper (which is naturally relatively cheap) for the heavy. Beware of bargains! If you would save, it would be better to select "second" or "retree" sheets of fair weight than the first quality of the thinner grades.

CHOOSING A SHEET Since all hand-made paper varies in perfection, if you wish a fine sheet, pick it with care, feeling it for weight, examining it for equality of grain, inspecting it (held to the light) for the water-mark which proves it to be genuine, and searching for specks, thin spots, lumps, or other defects.

MOUNTED PAPER As these "flat" papers must all be mounted or "stretched" by the artist before they can be used to best advantage (see the coming chapter), sheets already mounted on heavy board are becoming in-

creasingly popular. One simply asks for "Whatman mounted," designating the desired surface and size. The great convenience of these mounts justifies their extra cost. A particular virtue is that, as the wet pigment is applied, the surface does not develop the troublesome ridges common to unmounted paper.

Professionals, especially if instrumental drawing is involved, often fasten these mounted sheets to their wooden drawing boards by means of small nails around the edges. This holds them straight and true and tends to make them dry perfectly flat.

Boards of this type and quality, employing hand-made papers, are not to be confused with the cheaper "Illustration Boards," which are usually rather smooth and unresponsive. There is, however, an inexpensive board known as "eggshell" which makes possible very interesting results, particularly if a fresh, direct technique is employed, as in quick sketching. It will not stand abuse.

MACHINE-MADE PAPER Though machine-made paper is usually less satisfactory than hand-made, it does have the advantage of availability in a greater range of sizes. Keuffel and Esser's "Paragon," for example, comes not only in sheets of many sizes but in large rolls up to 72″ in width. From the latter it can generally be purchased by the yard. This Paragon paper can be highly recommended, incidentally, as a heavy, hard sized paper of 100% rag stock which insures it against the brittleness and discoloration to which many inferior papers are subject. It takes pencil, ink, and water color well, and stands erasing far better than do many other machine-made papers.

Some inexpensive papers are so pleasing in texture that one selects them for temporary uses without worrying as to durability. One such paper, popular for its rough texture, is known as "Morilla" (distributed by the Morilla Company of New York).

There is no Whatman machine-made paper, though it is said there is a German machine-made imitation so deceptive as to be easily mistaken for the genuine. Machine-made papers are usually quite different front and back (the back having mechanical characteristics), while those made by hand show both sides as practically alike. This makes identification fairly simple.

FRENCH PAPERS Among the most interesting and sympathetic of the machine-made papers, is one imported from France by Canson and Montgolfier of New York, and sold as Lavis "A." This is a hand finished paper of pure rag stock, supplied in different weights, sizes, and surfaces. The rough surface has a grain of unusually pleasing character. J. Floyd Yewell employs it in its mounted form most effectively, taking full advantage of its somewhat decorative character.

The same company furnishes a hand-made paper of pure rag called Aquarelle Canson. There are several pleasing surfaces as follows: Torchon (T), which is extra rough, Rough (R), Fine (F), and Smooth (S). It comes in several weights and sizes and in both a slightly creamy white and a rich cream. It bears the identifying watermark "Aquarelle Canson, France."

The author recommends both these papers highly, particularly to those who seek a texture a bit different from that of Whatman and like papers.

Some of our contributing artists have preferences as to paper, which will be mentioned from time to time as we describe their work.

SKETCHING BLOCK The student will find himself tempted to buy one of the many paper pads or "blocks" which are so frequently seen. Though we do not condemn these wholly, there is little to recommend them beyond their convenience for quick work. The paper buckles when wet, particularly after a block has been in use for a while, and seldom comes wholly flat when dry. "Spiral binding" sketch books seem more practical.

ODD MATERIALS The beginner is urged to avoid at first such odd materials as window shade cloth, canvas, wood, mounted tracing paper, etc. These are all interesting and can do no harm at the proper time, but the common materials present problems enough for the moment, as one will soon discover.

CHAPTER IV

MOUNTING OR "STRETCHING" PAPER

COMPARATIVE METHODS OF PREPARING PAPER FOR USE

We are now ready for some definite instructions on both the hand mounting and the "stretching" of papers.

MOUNTING In view of the cost and limited size of the mounted papers that we described in our last chapter, some artists mount their own. Here is a typical method. The selected paper, which should be of good quality (though not necessarily of heavy weight), is dampened thoroughly with the sponge (or soaked in water) until limp, and then pasted evenly all over the back with some such adhesive as drawing board paste, bookbinders' paste, or diluted glue. After this, it is laid paste side down on heavy mounting board, previously dampened (most dealers can supply such board). Next, with a protective sheet of paper placed over it, it is rolled or scraped or brushed to force out air bubbles and promote uniform adhesion. A photographers' squeegee is sometimes used in this connection. The whole is then weighted down where it can dry flat, as between two drawing boards loaded with books. Blotting paper is sometimes laid in to hasten the drying process. The mount will buckle if removed before thoroughly dry.

For particular work (as when paper which has been drawn upon must be mounted), or if larger mounts are needed than are customarily available ready made, one can turn to an expert for help. In New York, for example, J. Bohne, a picture framer, does all this sort of thing remarkably well.

MAKING A STRETCH Despite the popularity of these mounted papers, the old-fashioned "stretch" is in even greater use, serving the same purpose. It is so economical and practical that every student should master the art of making it.

Briefly, the customary stretching process consists of pasting the edges of a wet sheet of paper to the wooden drawing board, causing it, as it dries, to shrink smooth and tight. This sounds easy but is something of a knack: hence the following descriptions appear advisable.

THE BOARD The dampness involved is none too easy on the drawing board, so a second-rate one will do. It must, however, be strong, clean, fairly smooth, and large enough to accommodate the paper when swollen to maximum size. If instrumental drawing is considered, there must be a straight working edge. For the beginner a 16″ x 23″ board is ideal, accommodating a half-imperial sheet of paper, large enough for a medium rendering, a big sketch, or several small sketches.

For outdoor sketching, stretches are sometimes made on thin boards or even on wall board; in this case it is best to have a stretch on each side, both for convenience and to prevent warping.

Paper for stretching must be of good quality and fair weight or it may pull apart or split as it dries.

PAN METHOD Place the drawing board horizontally and lay the paper flat upon it. If machine-made, it should be right side up. This can usually be told by the grain, or by the watermark. The latter will read correctly with the paper in the proper position; hold your sheet against the light to see it. Turn up three-quarters of an inch or so of each edge, creasing it until it stands erect. Figure 28 shows ways of folding the corners to complete a paper "pan." Next, with a clean sponge, wet the inside (bottom) of this pan—the working face of the paper—with clear water, keeping the inner faces of the upturned edges dry. While your paper soaks, prepare the adhesive. Higgins' Drawing Board Paste is popular. Some prefer a good glue, such as LePage's. That in the tubes is convenient; use it full strength. Common white paste or mucilage is not sufficiently tenacious: if you use it you'll probably be sorry. Now, apply this adhesive uniformly over the outer faces of the upturned edges. Don't let it spread beneath the paper! Sponge the superfluous water from the paper pan, at the same time dampening the heretofore dry inner faces of

the upturned edges. Be sure the paper is placed straight and true; then press these edges down until they adhere to the board. As you do this, gently pull the entire paper surface as smooth as you can. It is soft in its saturated state, so don't pull too hard and tear it. If it does not come practically flat it is too dry; dampen it again; allow a minute for the water to penetrate, and try once more. When reasonably flat (shrinkage in drying will remove all minor wrinkles), rub the edges to the board with a knife handle to insure a firm bond. Thumbtacks are sometimes used to help hold the paper in place until the glue has set. This is all: as the paper dries it should shrink tight as a drumhead. Such a stretch customarily needs no further attention until one's work is completed; remember, in working, that the glued edges must be sacrificed when the paper is finally cut free.

AN ALTERNATE METHOD Lay your paper flat, face down, and dampen it to within an inch or so of each edge (don't turn the edges up). When it is well saturated, sop up the standing water, moistening the previously dry edges slightly at the same operation. Apply adhesive to these edges as a smoothly spread band three-quarters of an inch or so in width. The paper should now be quite flat: if not, dampen it some more, sponge up the surplus water, pick up the paper by the four corners (an assistant is valuable), invert it, and lower it carefully to the desired place on the board, being sure that no glue gets beneath the working surface. Proceed to strain and rub down as in the previous method.

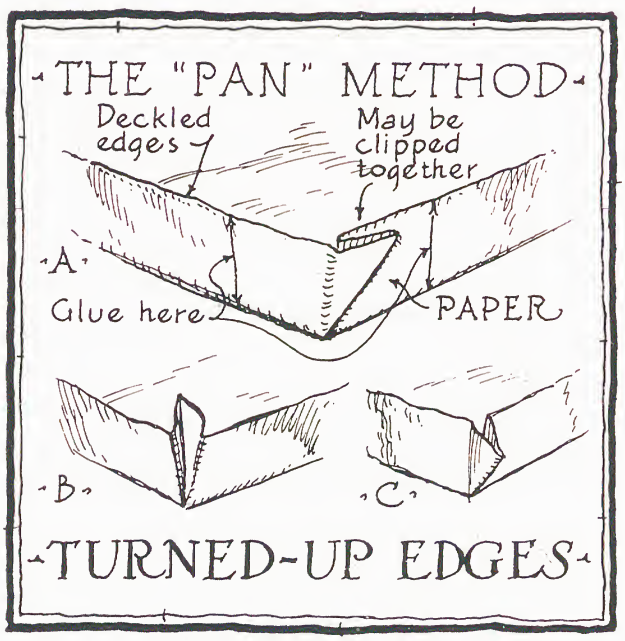


FIGURE 28

In both these methods there is sometimes danger of the dry board sucking the moisture from the paper before the glue has set. To avert this, dampen the board before you place the paper on it, if you wish, and keep the paper moist for a while after it is in position.

FURTHER POINTERS In still another method the adhesive is applied directly to the drawing board in just the right position to receive the paper, previously dampened.

Again, stretches are made with gummed paper tape as a practical substitute for the glue. That about two inches wide, lapping well onto both paper and board, is best. Several thicknesses are sometimes employed in order to withstand the strain of the shrinking paper. Even when glue is used, the tape proves a convenient reinforcement, which, covering as it does the rough deckling common to the edges of hand-made papers, permits the T-square to glide over them easily.

BUCKLING OF PAPER Whatever method of stretching is followed, your paper will quite likely hump somewhat after large or frequent washes are applied. Unless the paper is unusually thin or insufficiently strained, however, this buckling should prove negligible, and you can rest assured the surface will come absolutely flat again when dry. At the worst, the buckling will be less than with unstretched paper.

A WORD OF CAUTION Stretches, especially when large, sometimes work loose, due to lack of glue, or buckle exceedingly because not stretched enough. On the other hand, it is possible, as we have already hinted, to stretch paper so tightly that it splits or tears, particularly if thin or of poor quality. Exposure to the heat of a radiator or to extreme cold is enough to shrink or contract paper to the breaking point. This all suggests reasonable care in both the preparation and use of stretches.

CUTTING OFF THE STRETCH When you have finished a painting, leave ample time for it to dry before cutting it from the board. Stretched paper is very deceptive; though it may feel dry to the hand it may still contain enough moisture to cause it to cockle badly when released. After your last pigment is laid, let your paper stand an hour: all night is better. And don't cut it off on an extremely

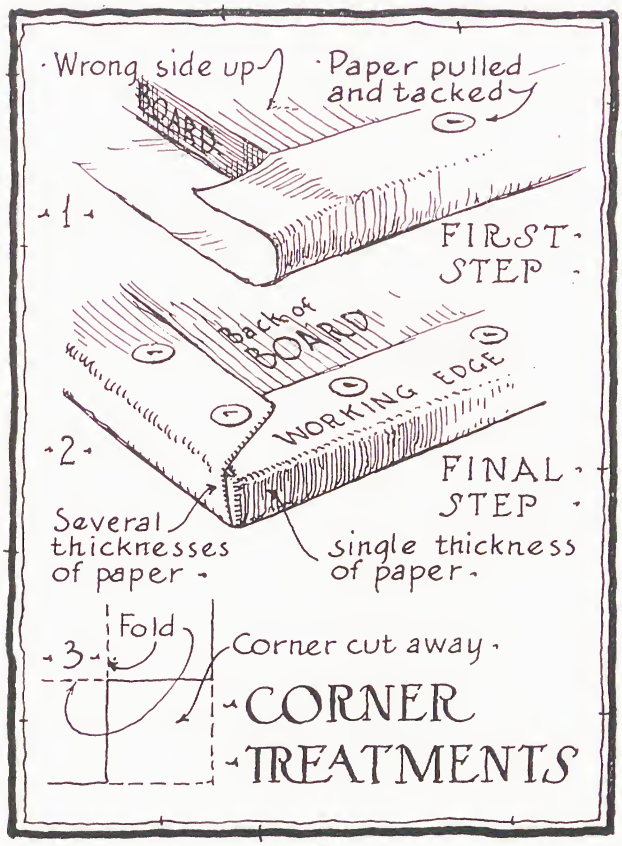


FIGURE 29

damp day unless you dry it artificially first.

The cutting may be done with knife, razor blade, or cutter (Figure 26). Don't cut one end and then the other, thus setting up a tension which may tear the paper, but follow around the sheet continuously, starting with a long side.

REMOVING THE GLUED EDGES Don't scratch and scrape at the glued strips remaining on your board as so many beginners do. This is unnecessary. Tear away such paper as comes freely; then soak the remainder thoroughly with water, going about something else for a few minutes while they soften. Wet rags laid on them will hasten this action. Soon they can be stripped away; wash the glue from the board and you are through.

A GLUELESS METHOD If you particularly dislike the somewhat messy use of glue which our previous stretching methods involve, you may prefer another way. Select a board small enough to permit the paper to overlap it by about an inch and a half all around. Thoroughly saturate the entire paper; lay it on the board (or, if you wish, lay your board on the paper) and thumbtack these overlapping edges to the back. See Figure 29. As you do this, gently but firmly strain the paper. Tack it first at opposite centers, working gradually towards the corners. With heavy papers, cut out squares at the corners if you wish to prevent humps such as might interfere with the working of the T-square. Stretches of this sort are sometimes made over the frames (stretchers) used for supporting artists' canvas. The wedges at the back can be employed to force the paper quite tight; shrinkage will do the rest.

STRETCHING FRAMES Theoretically, stretching "frames" (such as the Cox frame put out by Winsor & Newton—see Figure 30) should save the artist a great deal of time and trouble, for the paper is merely dampened, laid over the frame, and clamped in position by means of strips held in place by clips. The ones the author has tried have been disappointing, proving insufficiently rigid and permitting the paper to slip.

WORKING OVER GLASS There is still another method of preparing paper for painting, occasionally referred to as the "Dutch" method because of its popularity at one time among certain Dutch artists. Wet blotting paper or a wet blanket is laid upon a sheet of glass placed horizontally. The paper, also wet or extremely damp, is laid on top, the subject having been previously sketched in pencil with the paper dry. The larger washes are applied

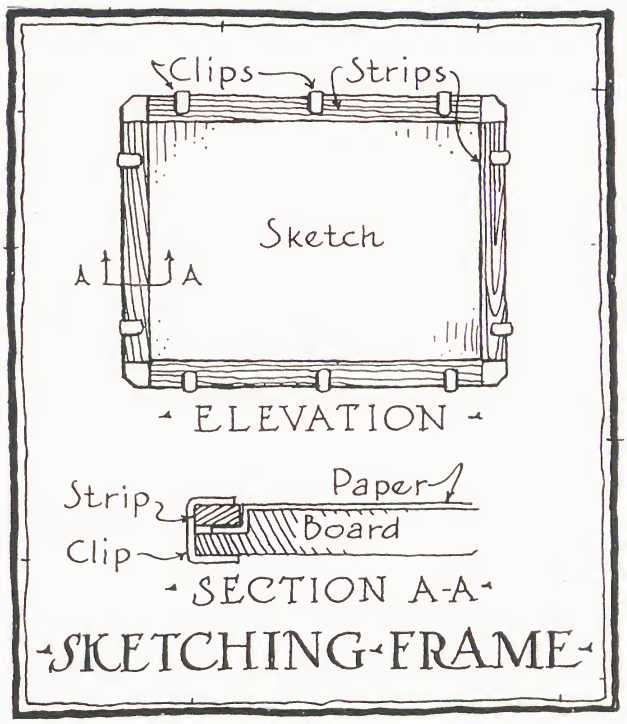


FIGURE 30

to the paper while it is still damp; they merge and spread with many interesting accidental effects. As the paper gradually dries the finer detail is added. All the colors must be used in greater strength than in other methods, as they seem less vivid when dry.

MOUNTED TRACING PAPER A surprising number of the architectural renderings reproduced in this volume were done on mounted or, as it is called, "floated" tracing paper. Among those who employ it for the bulk of their work is the noted renderer, Schell Lewis. So, with his permission, we shall present, in abridged form, his method of mounting, as fully described in his illustrated article, *Mounting Tracings* in PENCIL POINTS for January, 1929.

Briefly, the drawing, having been partly or wholly rendered in pencil on tracing paper (usually over an instrumental layout), is laid face down on a sheet of glass and its back is coated with paste. The mounting board is next dropped onto it and then lifted, with the drawing adhering to it, after which the excess paste is scraped out. Drying completes the operation.

The glass should be plate of suitable size, firmly fixed horizontally to a table top. Along the upper and right-hand edges of the glass, wooden strips an inch or two wide should be fastened to the table to project above the glass a quarter inch or so and act as guides in laying the mounting board. The upper guide should have a wood lip projecting over the glass about a half inch, raised above the glass far enough to let the mount slide under it. This will prevent a warped mount from slipping up over the guides, ruining the drawing. Under the glass there should be a sheet of paper or cardboard with the several sizes of mounts used in the office laid out on it instrumentally—20″ x 30″ and 30″ x 40″ are common. Inside these outlines there should be several border lines drawn all around, say 2″, 3″, and 4″ from the edges. This makes it simple to align the drawing on the glass and tell instantly what size mount is needed. It is best to mount the drawing, and trim the board afterwards.

The paste brush should be a flat paint brush 2″ wide, with no metal parts. It must be kept absolutely clean. Higgins' Drawing Board Paste diluted to the consistency of cream is a suitable adhesive. A wooden scraper about 8″ long, 2″ wide, and ⅛″ thick, with edges and corners rounded, can be made of cigar box wood. Also a sponge is needed, a clean towel, and a roll of tracing paper to lay over the drawing when scraping the paste out.

Now, see that your glass is clean and dry. Close the window to keep out cinders. Lay the drawing (previously sprayed with fixatif) face down on the glass, aligned to the border desired. Hold the drawing on the glass with the left hand, and brush a paste stroke across the middle of the length of it (with experience you will learn how much your paper will swell). From this axis, work the paste toward the sides in both directions, brushing out the wrinkles as they appear, until the surface is covered evenly almost to the edges which parallel the axis. Next, paste these edges carefully, being sure they don't curl under. Properly pasted, the drawing will now lie flat on the glass. Don't worry over any paste that may be brushed onto the glass. Slip the edge of the mount under the lip at the top of the glass and against the guide at the right, and lower it, face down, to the drawing. Hold it firmly with the left hand and rub on it heavily with the right. Don't let it slip! Peek under one corner to see if the drawing is adhering to the mount. If not, rub some more. Then lift the mount (you should find the drawing held to it flat, with no wrinkles) and place it face up on the glass, hastily sponged clean, or a table. Lay a sheet of white tracing paper larger than your drawing onto it and work out the excess paste with your scraper, scraping from center to edges. Next lift this protective paper carefully (be sure the drawing doesn't come with it). If you have missed any spots, lay a fresh paper down and work them out. Wipe the excess paste from the mount with a damp sponge and the mounting is completed. It is quite common practice to mount a piece of blank paper of the same kind and size as the rendering on the back of the mount to prevent curling. Many artists finally place the mount flat, as between weighted drawing boards, to dry.

Though this method which Mr. Lewis uses so successfully is perhaps the best of those commonly employed, especially for large work, there are various ways of accomplishing a like result, each with its ardent advocates. The following popular method requires no glass.

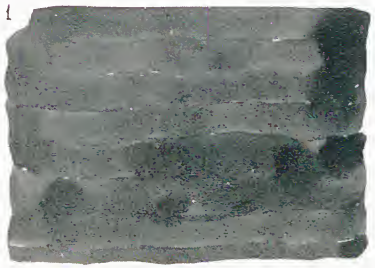
Newspapers (two thicknesses are enough—printer's ink will rarely come off under the action of water) are laid flat on a drawing

board, and the tracing paper drawing to be mounted (or any drawing on reasonably thin paper), previously "fixed" and trimmed to size, is placed face down upon them, about three or four inches from the farthest edge. A large sponge is then used to wet the back of this drawing thoroughly and evenly, after which the excess water is sponged off. Thick paste, previously mixed in adequate quantity, is next applied evenly over the entire sheet with sponge or brush. The mount (illustration board is popular) is thoroughly wet on top with water and carefully laid, face down, on the paste-covered drawing. It is pressed a bit to make sure it adheres, after which it is turned face up again, bringing the drawing with it. The drawing should now be lifted from the mount a short distance, first at one end and then at the other, and pulled very gently (don't tear it!), after which it should be dropped back onto the mount, every effort being made to eliminate wrinkles yet without pulling it out of shape. The hands should be immaculate or thumb or finger marks may later show beneath the tracing. Now, with the drawing still face up, lay tracing paper slightly larger than the mount over it and squeegee the drawing smooth, working from the center out. The edge of a 6″ or 8″ celluloid triangle will do; some like a photographers' squeegee with rubber in the blade. Next the protective paper is removed and the mount sponged clean, after which a fresh paper is substituted. The mount, with its drawing, is lifted to one side for a moment, and if the newspapers are wet or pasty, fresh ones should replace them. After this the mount, with its drawing and protective paper, is placed face down on the newspapers again, and a sheet of tracing paper is mounted on the back. The completed mount is now laid between weighted drawing boards to dry: when removed, it is trimmed parallel to the drawing. In a well mounted drawing, the tracing paper can often barely be detected from the mount. This blending of mount and drawing is helped if a pencil line is carried accurately around the edges of the tracing as a margin.

Some draftsmen will stick to the "old" method, now largely superseded. In this, the mount is generally tacked, face up, to the drawing board, and a fine pencil line, barely visible, is located where the edge of the drawing, or perhaps the margin line, is to be placed. The mount is then moistened (some do this before it is tacked down) and the previously trimmed tracing is spread with paste on the back, lifted, and lowered to the paper in line with the penciled guide. So far as possible, wrinkles and air pockets should be avoided. Clean tracing paper is next laid over the whole and the surplus paste and water squeegeed away. The protective paper should be replaced several times if necessary. When the tracing is flat and smooth, the edges of the mount are sponged uniformly, a final sheet of protective paper is laid over the whole, and a drawing board is put on top and weighted down for an hour or two.

Any one of these methods requires something of a knack for successful application: it is well to experiment at first with blank paper. If one has large or important projects to mount, and distrusts his ability to do the job well, he can obtain the services of a professional. See the third paragraph, page 15.

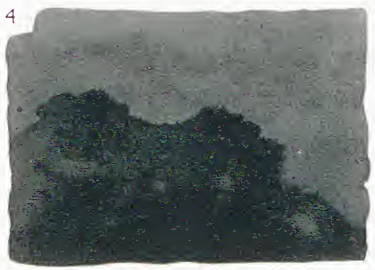
PLATE 1 WASH LAYING



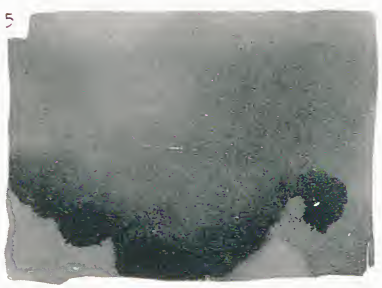
1 THIS WASH WAS RUN TOO DRY, WITH NO PUDDLE EXCEPTING AT THE RIGHT END OF STROKES

2 THIS, THOUGH BETTER, STILL LACKED SUFFICIENT PUDDLE AND THE PIGMENT WAS NOT THOROUGHLY MIXED

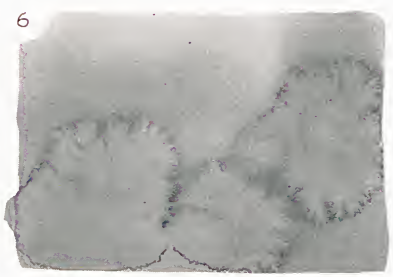
3 MUCH BETTER, BUT LEFT TOO WET AT BOTTOM WHERE IT DRIED VERY DARK, GIVING A GRADED EFFECT



4 LEFT TOO WET AT BOTTOM CAUSING "RUN-BACK" OR "FAN". SUCH EFFECTS MUST BE AVOIDED IN CAREFUL WORK



5 HERE TOO MUCH DAMPNESS WAS TAKEN UP AT THE BOTTOM WITH THE TOP WET

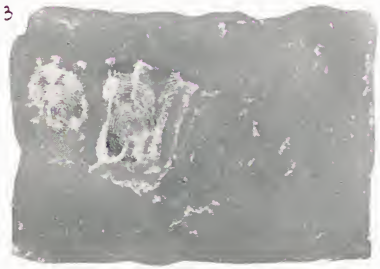


6 TYPICAL "FANS" CAUSED BY THE CHANCE DROPPING OF PIGMENT ON THE DRYING WASH LEAVE A WASH ALONE UNTIL DRY

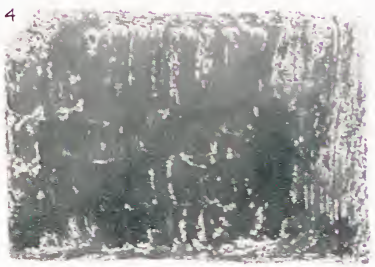
PLATE 2 WASH LAYING

1 THIS WASH WAS "PUDDLED" ON WITH THE PAPER FLAT PARTICLES OF PIGMENT FLOATED OFF AND FORMED DARK EDGES

2 THIS SPOT WAS CAUSED BY A DROP OF OIL INVISIBLE ON THE PAPER BEFORE THE WASH WAS APPLIED



3 PERSPIRATION FROM THE HANDS WAS RESPONSIBLE FOR THIS DEFECTIVE WASH PAPER MUST ALWAYS BE CLEAN



4 A DIRTY BRUSH CAN BE BLAMED FOR THIS FAILURE TO PRODUCE A SMOOTH FLAT WASH

5 HERE AN EVENLY GRADED WASH WAS INTENDED. THE WATER SHOULD HAVE BEEN ADDED MORE GRADUALLY

6 THOUGH NOT THE EVEN TONE SOUGHT THIS IS NOT LACKING IN A CERTAIN INTERESTING ACCIDENTAL QUALITY

SOME FREQUENT FAILURES IN STUDENT WASHES

It is essential to acquire the knack of avoiding these faults

CHAPTER V

EXERCISES IN WASH MANIPULATION

INSTRUCTIONS IN LAYING FLAT AND GRADED WASHES

Now comes the fun of our first painting exercises! Our immediate problem is to learn the common methods of applying pigment to paper. There are several of these. We can "run" or "lay" it on in the form of "washes"; drop it onto dampened surfaces, letting it spread or "mingle" with the water or other pigments; "stipple," "dab," or print it on with brush strokes usually laid side by side; draw it on by employing the brush in a linear manner; "roll" it on by rotating the brush; spatter or spray it on, etc. Rarely, it is applied by means of the sponge, a bit of cloth or cotton, or even the fingers.

WASH LAYING Of these methods, the most fundamental is wash laying. We shall devote the rest of this chapter to it. You must master this at once or you will be under a constant handicap.

The term "wash," as we use it here, means a mixture of any water color pigment (whether black, white, gray or colored) and water; also the tone which results from flowing such a pigment over the paper and allowing it to dry. We likewise use the same word as a verb to describe the act of applying this pigment; in other words, we "wash" a given area.

PIGMENT Blacks and browns offer a good starting point. Incidentally, when we speak of a wash drawing we usually think of one in these more or less neutral tones. Those pigments with little sediment are the easiest to handle, and produce washes of the greatest clarity and uniformity. In most makes, lamp-black is good. Ivory black generally has a bit more tendency to precipitate. Peach black is extremely hard to manage. Sepia is perhaps the most amenable of the browns. With these under control, try all your colors as discussed in the following chapter.

The architectural student must give particular attention to wash laying, as the success of much of his rendering depends to no small extent upon it. He usually gains his first practice from his design problems. The popular medium for years (and an ideal one it is) has been India ink in stick form; see Figure 31.

The same illustration shows the slate slab which is needed for "rubbing up" such ink, after which it is strained for best results, or siphoned, via a wet string or wick, into a separate dish placed at a lower level. Harbeson, in *The Study of Architectural Design* (Reinhold Publishing Corporation), and Magonigle, in his *Architectural Rendering in Wash* (Scribner's), give full directions for this ink rendering. With ink mastered, water color paints should be attempted. The artist seldom uses stick ink.

EXERCISE 1: THE FLAT WASH Washes are of two kinds—flat (uniform) and graded (changing in tone by easy degrees). The first interests us now. Fill a saucer about half or two-thirds full of water and stir in a quantity of the selected pigment until you have a mixture of medium strength. (Later try it thick and thin.) Dampen a sheet of stretched paper (or mounted paper, fastened to your drawing board) with plain water applied with your large sponge or brush. This preliminary, while not absolutely necessary, makes good wash laying easier. Let the paper stand until the last vestige of shine has disappeared. Pitch your board at an angle of five or ten degrees from the horizontal. If too flat, the pigment will not flow properly; if too steep, the wash may get out of control, running from the board. Have rags or blotters at hand for such an emergency. (Washes flow more freely on smooth paper than on rough; some pigments run more quickly than others. Pitch, in controlling the speed of flow, affects the character of the wash.)

Now select a fair sized brush (No. 7 or No. 8 is good—see Figure 11) and you are ready to begin. Avoid small brushes; they are intended only for detail. Your first washes should be about five or six inches square (instrumental boundary lines may be drawn, though it is easier not to be so restricted).

Later, it is excellent practice to pencil boundaries around such shapes as squares, triangles, and circles, and try filling them exactly. Still later, practice on large areas. Imagine the skill necessary to control washes like those used in rendering Plates 3 and 4, pages 24 and 26.

Rinse the selected brush in water (cultivate the habit of doing so frequently); remove most of the water by touching the brush to cloth or blotter (or by "slatting" it towards the floor—an efficient measure, not popular in the home!); dip it in the pigment (stir the color every time you do so) and lift it ready to apply to the paper.

If you are right-handed, start the first stroke in the upper left-hand corner of the selected area. Hold the brush freely and naturally, much like the pencil in writing (though with its angle varied according to conditions), and, sliding it along the paper lightly, paint a horizontal stroke the desired distance to the right. The object is to apply enough pigment so that an actual puddle will form along the lower edge of the stroke. If you fail in this, re-dip the brush immediately (don't forget to stir!) and apply a second stroke to the same area. This matter of obtaining a puddle at once cannot be too strongly emphasized: the beginner frequently uses so little pigment that it "sets" immediately, each brush stroke drying as a separate stripe. See 1, Plate 1.

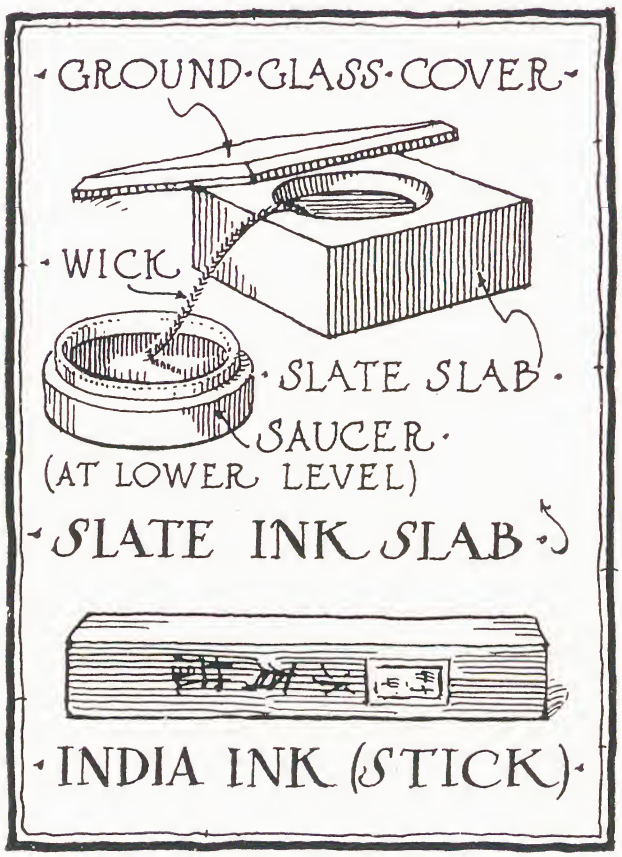


FIGURE 31

With the puddle formed, recharge the brush (stir!) and take a second stroke from left to right, the point of the brush just touching or slightly overlapping the lower edge of the puddle, which should flow down and reform at the bottom of the new stroke. Repeat this process over and over, gradually advancing the wash down the paper. You may not have to dip the brush for each stroke (the aim being to keep the wash, puddle and all, as uniform as possible) but always do so before the pigment is wholly exhausted. The larger the wash area, the bigger the puddle required.

Don't *rub* the paper with the brush; use a feather touch. The brush should merely convey the pigment to the paper and guide it, the wash flowing of its own accord. This is a fundamental difference between water color and oil painting; in the latter the color is normally brushed in.

STOPPING THE WASH As the bottom of the predetermined area is approached, add no new pigment, but carry the puddle down until it exhausts itself. If there is excess pigment remaining as the lower edge is reached, absorb it with the brush, touching the latter to rag or blotter as proves necessary, or squeezing the pigment back into the godet. Then watch the lower edge for a moment and if a new puddle forms—a thing which may happen several times—absorb it.

However faulty a wash may seem, *never work back into it until it is dry.* Trouble will almost certainly result if you do. It is far easier to learn to lay washes well than to learn to repair them when they go wrong.

Plates 1 and 2 show some typical faults; all but the last pair (5 and 6, Plate 2) can develop with flat washes. Study these with care, reading the notes. With a bit of practice you can learn to avoid most of these difficulties. Wire edges, however, like those surrounding the wash at 1, Plate 2, are a common cause of annoyance. Resulting from gravity and capillary attraction, they are most frequent when heavy, settling pigments are used. The bigger the puddle and the slower the drying (as with the board flat), the greater the danger. If overconspicuous, dampen them carefully with

a fine pointed brush (after they have thoroughly dried) until they can be absorbed with brush or blotter. Sketches 2, 3, and 4, Plate 2, point to the need for absolute cleanliness.

Paper which is insufficiently stretched or not stretched at all is another troublesome thing as it buckles into a series of corrugations, the pigment particles sliding down the hills into the valleys to dry, the corrugated effect being still evident even if the paper comes flat again.

ALTERNATE METHODS As pigments and papers vary in their characteristics, sometimes one manner of working is better than another. Experiment with various ways of laying tone. If a color tends to set too quickly, revealing horizontal strokes when dry, change your method by letting each stroke overlap half, or even the whole, of the previous one. Or use a rotating (stirring), rather than a direct, motion of the brush. If you find that a left-to-right stroke causes an over-accumulation of pigment at the right, as at 1 and 2, Plate 1, substitute a back-and-forth stroke. In short, use the method which produces the best results. The main thing is to keep an even distribution of pigment and to avoid the disturbance of pigment particles once they have set. You may at this time, if you wish, try flat washes of all your pigments, noting the characteristics of each.

EXERCISE 2: SUPERPOSITION When you have acquired the knack of laying individual flat washes fairly well, with light, medium, and dark pigments, even to the extent of placing them within definite boundaries, try running one wash over another which is dry, for this is a thing which frequently has to be successfully accomplished. Unusual care must be exercised not to loosen the underlying pigment: both lightness of touch and reasonable speed are therefore essential. Some pigments, at best, are intractable in superposition. As you work, note the ones which give the greatest and the least satisfaction.

If you superpose washes of two or more colors you will have your first contact, so far as these exercises are concerned, with effects of color mixture, for one color over another creates a third.

EXERCISE 3: GRADED WASHES, DARK TO LIGHT As most subjects can best be interpreted by washes which grade from dark to light, from light to dark, or from one color to another, our next step is to master them. Let us start with grades from dark to light.

Form a puddle of dark pigment at the top of a predetermined area, just as for a flat wash. Your problem is to dilute this gradually as you guide it down the paper. If you dip your brush in water and apply it directly to the puddle of pigment, advancing the wash through repetition of this process, you will be likely to obtain a streaked result. The gradation may be too rapid, as it was at 5, Plate 2. (This wash, despite its failure to give the desired result, is highly interesting, the light portions seeming cloudlike.) Or too much of the dark pigment from above may follow down to prevent the desired lightness below. So practice until you acquire the knack of obtaining the necessary uniformity.

Here's one method. With a reasonably generous puddle of the selected pigment formed, dip your brush into your godet of pigment and then into water, quickly blending the brushful of mixture on another saucer or suitable surface (the edge of your paper will do) and immediately apply it to form the second stroke of your wash, merging the new mixture with the original puddle as it runs down. For this, a rotating (stirring) motion is best. Constantly repeat this process as you advance the wash, also absorbing superfluous dark pigment as it proves necessary.

Some artists vary this method by repeatedly adding water, between strokes, to the saucer of original mixture, keeping the whole thoroughly stirred: this is a good process. In still another method, favored for large or particular work, several saucers of the selected pigment are prepared ahead of time, varying uniformly in degree of strength. Washes of these are then applied in the proper order, each flowing gradually into the next, any excess of the darker pigment from above being occasionally absorbed. Try these grades with different pigments.

EXERCISE 4: GRADED WASHES, LIGHT TO DARK It is considered easier to grade from light to dark than from dark to light. The former process is reversed. Start at the top with a puddle of pure water or light tint, adding darker pigment a bit at a time as you proceed, absorbing any excess of the light pigment. For important work, the previous preparation of several saucers of pigment of varying strength is recommended. The knack is to add the darker pigment so gradually that

A TYPICAL COMPETITION DRAWING FROM THE OFFICE OF JOHN RUSSELL POPE, ARCHITECT

Great skill and care are required for this sort of rendering

the final wash shows perfect gradation. Though the wash at 6, Plate 2, failed completely in this respect, it suggests clouds or distant trees rather well.

EXERCISE 5: DOUBLE GRADES Practice washes grading from dark to light and back to dark, and vice versa.

EXERCISE 6: GRADING FROM COLOR TO COLOR Don't confine your attempts to a few pigments, but try all the colors in your box, as further discussed in the coming chapter. Grade each from light to dark (see Plate 5) and from dark to light; then practice grading from one hue to another. Mix the two in separate saucers and start the wash with either, substituting the other by easy degrees. This is not only excellent brush practice but it gives you a vital contact with color mixture; it is fascinating to watch the birth of the resultant new colors. Also run washes grading from a given hue to water and then to a second hue. Washes showing gradation from color to color as in the spectrum (see top of Plate 7) should be attempted, too.

EXERCISE 7: FRENCH METHOD It is extremely hard, even when working in monochromatic (one color) wash, to carry a sudden grade across the narrow dimension of a long rectangle or similar form. In one method, sometimes called the "French" method, true gradation is simulated by superposing a series of flat washes, each a little narrower than the previous one. Very faint parallel pencil lines are sometimes first ruled as a guide. It will be noted that this method was used in parts of Plate 4. It is particularly well suited to many architectural purposes, as in cornice shadows where lines of mouldings can be utilized to bound the various washes. Practice this method, both in monochrome and color.

EXERCISE 8: OVERLAPPED GRADES In narrow areas where you desire to grade from one color to another across the narrow dimension, your problem is often simplified if you utilize a pair of overlapped graded washes. You can start a yellowish or orange wash (for reflected light) at the top of a cornice shadow, for instance, as in Plate 166, page 315, and grade quickly to pure water. Or, with the board reversed, you can run the wash from water to yellow. When dry, a wash of the second color—perhaps blue-gray—can be laid in the opposite direction in the same manner, the final effect being of yellowish at the top grading to bluish at the bottom. Experiment sooner or later with this sort of gradation.

EXERCISE 9: TWO STROKE GRADES Occasionally on these long, narrow spaces which are to be graded crosswise, one simply draws his brush, laden with some selected pigment, quickly but steadily the whole length of the area to be toned, covering about half the width of it, immediately following this (before the wash has set) with an overlapping stroke of the second pigment, covering the rest of the area. With practice, a good grade can be produced. Why not try your hand at this?

EXERCISE 10: TWO COLORS AT ONCE By dipping one side of your brush in one hue and the other side in another, beautifully graded effects, as on flagpoles, tree trunks, masts, etc., can often be formed by means of single strokes. The brush must be tried, of course, on practice paper. A flat brush is preferred. This method is at its best for quick sketching: see how well you can manage it.

EXERCISE 11: SUPERPOSED GRADES You have attempted running fairly large, flat washes, one on top of another. Do the same thing now with grades. Remember to wait for the first to dry thoroughly before adding the next, and work fast and lightly. You will discover that whereas some beautiful tones can be built up through superposition of wash on wash, certain pigments do not accept graciously this sort of treatment. Read Chapter VI in this connection. For most pur-

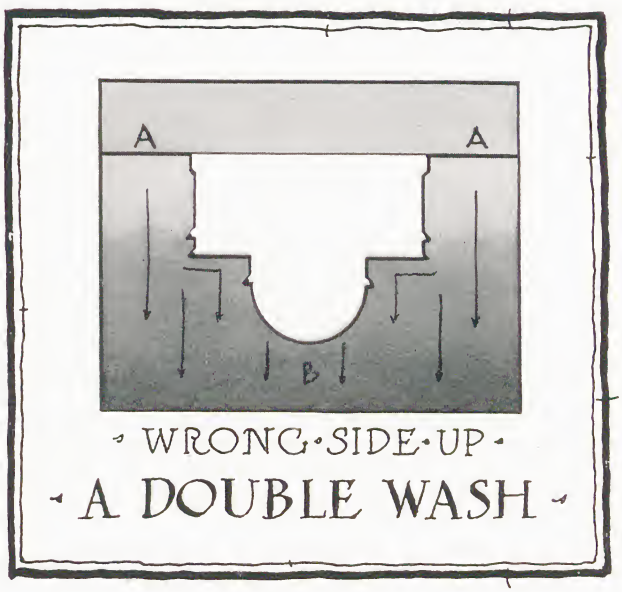
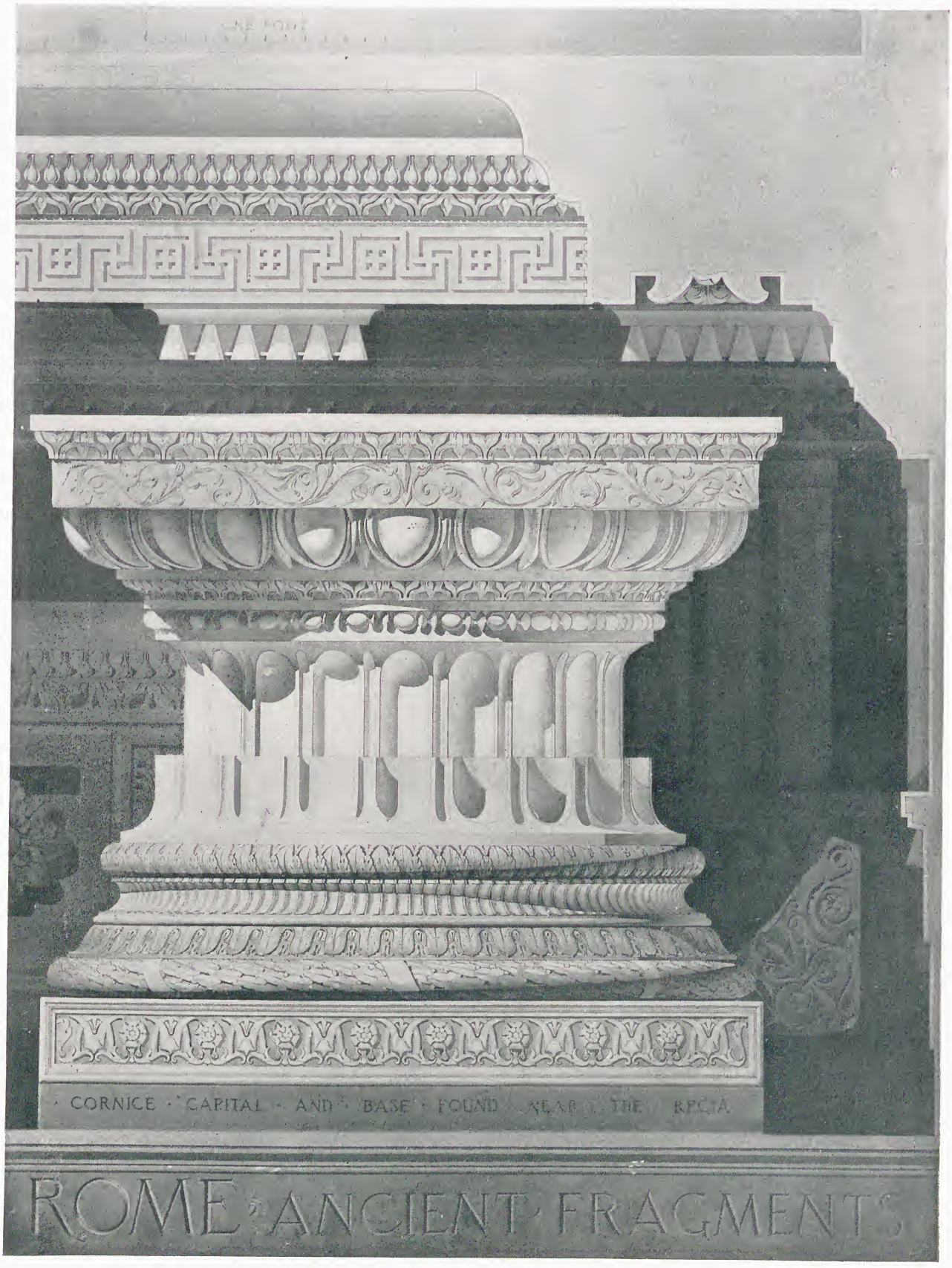


FIGURE 32



A BEAUTIFULLY RENDERED EXAMPLE BY EDGAR I. WILLIAMS

poses, direct effects are considered better than those obtained through superposition, but there are many exceptions.

EXERCISE 12: SIMULTANEOUS WASHES It frequently happens that pigment must be applied to an area so broken in shape as to make necessary the running of two or more like washes simultaneously. If one is rendering a building with a dome or tower, for example, and inverts his paper in order to grade a sky from light at the horizon to dark at the zenith, he will doubtless find it advisable to start a pair of washes, one on each side, as is indicated at *A-A*, Figure 32, grading them so equally that when brought together, at *B*, they will blend perfectly. The usual method is as follows. Try it. Advance one wash an inch or so; then the other. Next, darken your saucer of pigment a bit and advance both washes. Continue this alternation, using darker and darker pigment, until the two washes meet to form one, and proceed from this point in the customary manner. If the dome or tower profile is complex, a small supplementary brush is handy in bringing the washes exactly to it.

If your sky is to be flat rather than graded, you can substitute one wash for the two, turning the board as is indicated in Figure 33. Begin the wash as at 1 (*A*), gradually rotating the board as at 2, advancing the wash to *B;* the arrows show the approximate direction of flow. Finally swing the board to position 3, completing the wash at *C:* the portion at *A* must be dry by this time or there is danger of runbacks.

VARIETY OF PRACTICE Though you need not become adept at every phase of wash laying before turning to other work, never lose any opportunity of improving your dexterity in this direction. Eventually, try all your pigments, papers, and brushes, and different slopes of the board. Many otherwise expert painters have failed to master this trick and as the result are under a constant handicap which a few hours concentrated practice would overcome.

The architectural renderer needs special skill, as is made plain by Plates 3 and 4, and is advised to seek further instruction in the books by Harbeson and Magonigle already mentioned.

OTHER METHODS OF PIGMENT APPLICATION Though we have given this entire chapter to wash laying (which, as was stated in the opening paragraph, is but one of the many ways of applying pigment to paper), we shall not neglect, at the proper time, such matters as mingling, dabbing, spattering, brush "drawing," etc. Each one is important.

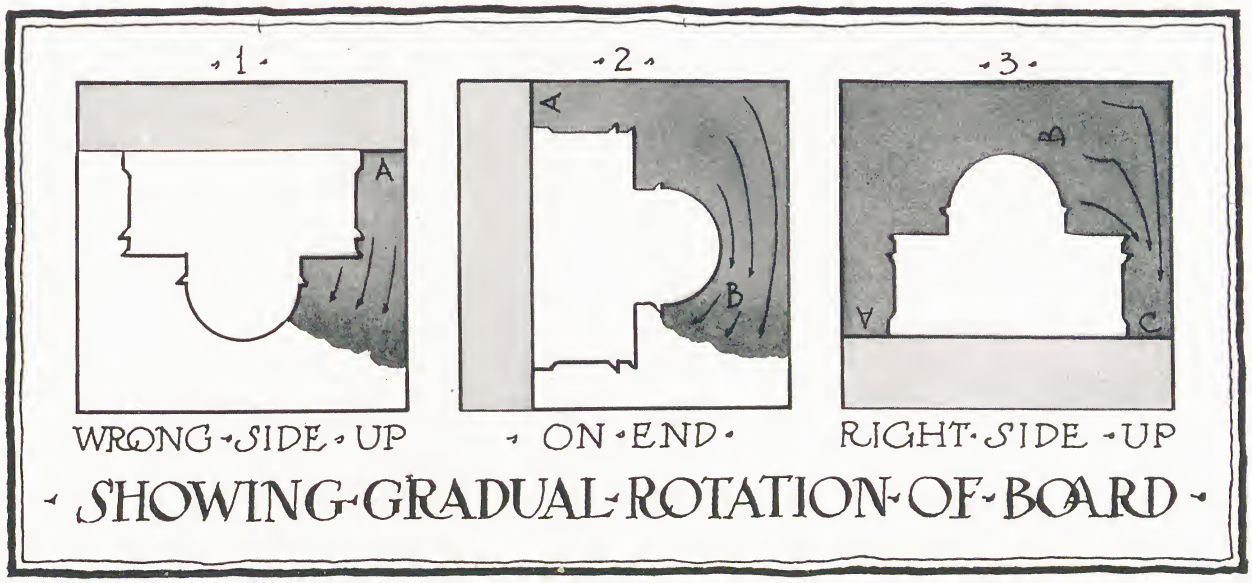


FIGURE 33

A STUDENT'S COLOR CHART SHOWING THE CHARACTERISTICS OF HIS PIGMENTS

One should keep such a chart on hand for ready reference

CHAPTER VI

PIGMENT ACQUAINTANCE EXERCISES

HOW TO GAIN FAMILIARITY WITH YOUR PIGMENTS

Though such practice in wash laying as was recommended in the last chapter should give one at least a speaking acquaintance with his pigments, he should now make a concentrated attempt to learn their individual characteristics, investigating every color in his box as to hue, degree of transparency or opacity, tendency to precipitate, amenability to application, resistance to water and light, etc. He is urged to perform the following exercises thoughtfully and neatly on good paper, with the idea of saving the results for future reference.

EXERCISE 13: PIGMENT ACQUAINTANCE Plate 5 is the reproduction in tone of a typical pigment acquaintance practice sheet which was done in full color. It is offered to guide you in making one for yourself. The original was drawn on a half-imperial sheet of cold pressed Whatman board (15″ x 22″), the small rectangles (one for each color in the box) measuring 2″ x 4½″. Each was filled with a wash, grading from almost pure water to the strongest color of which the pigment was capable. For comparison, the reds, yellows, blues, etc., were grouped together as in color box or palette. The lettered notes were added from time to time as the individual characteristics of the pigments were learned.

With such a chart at hand, one can see at a glance the hue and intensity of each of his colors in both light and dark values; hence its value as a reference. In making yours, you should try to store up definite mental impressions of the results, so as to have in mind just what every one of your pigments can be called upon to do.

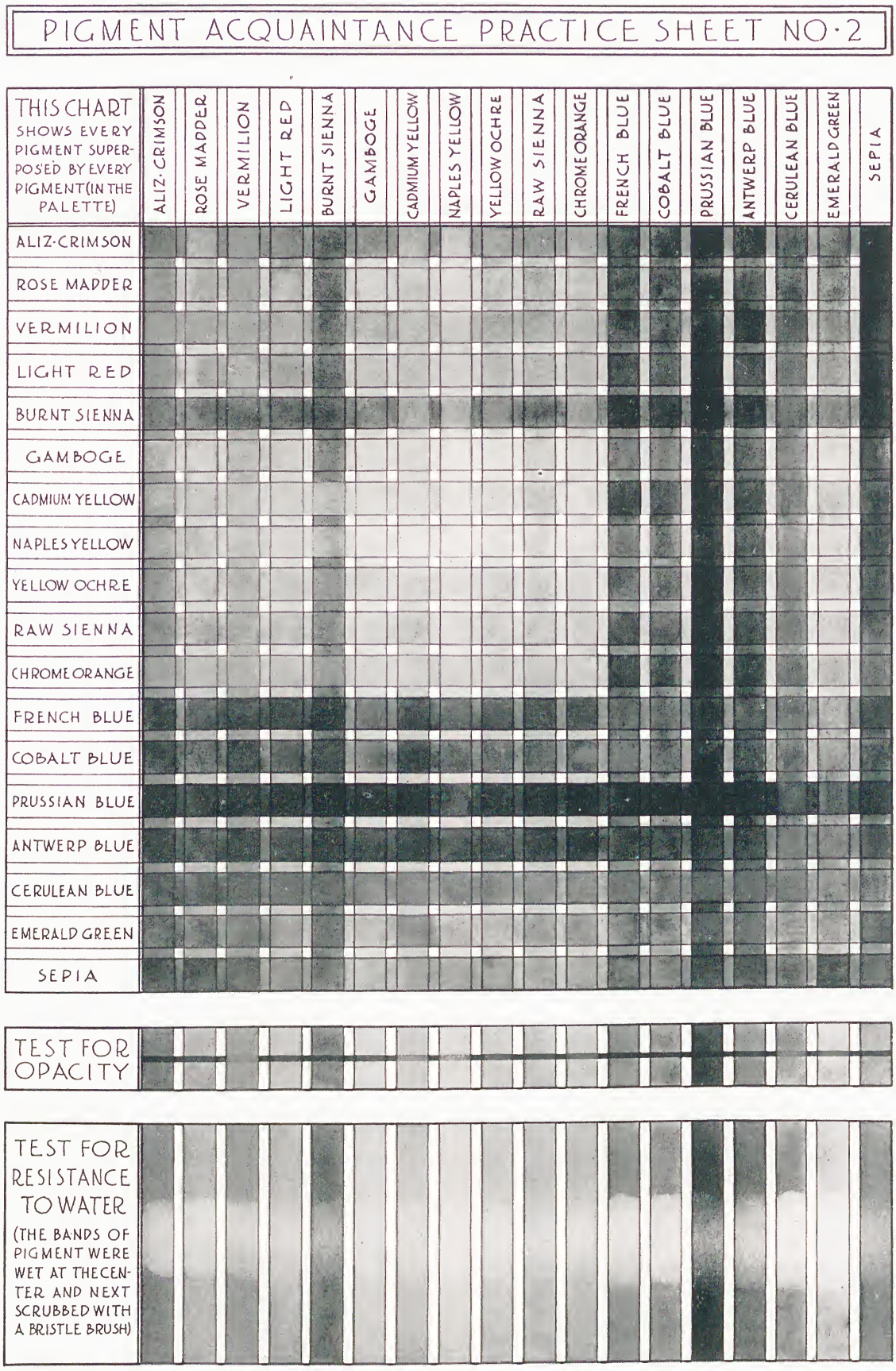
EXERCISE 14: PIGMENT ACQUAINTANCE Plate 6 reproduces in tone three helpful color experiments which you should perform for yourself. In the first, a large square was laid out, covering the upper portion of a half-imperial sheet of Whatman cold pressed board, and ruled off in bands—a vertical and a horizontal one for each pigment. Narrow bands of separation were also provided to make the contrasts more emphatic. Full strength flat washes of each color were brought down from top to bottom and, when they were dry, repeated across the sheet, giving a plaid effect.

Perform this exercise and you will learn that many new hues can be created by superposition of your present pigments. Also that some of your pigments can be washed over to advantage while others cannot. You will note, too, the relative transparency of your pigments. As a reference you can always turn to this chart as a reminder of the characteristics of any given hue, particularly as superposed by some other hue. If you wish to see what pigment or pigments will give a desired hue, you can hunt on this chart for that hue, or an approximation of it; you can then readily ascertain its component parts.

FINDER In this connection, cut a small hole through heavy white paper or cardboard to enable you to single out any individual hue on this chart to study without the distraction of neighboring colors. It is helpful to get into the habit of making comparisons of your colors with white, because hues, in water color work, are generally viewed and judged against a white background.

Returning to Plate 6, as a further test for opacity the vertical washes were extended, when first run, to cross a previously ruled line of waterproof black ink. Though all these pigments were of the so-called "transparent" type, note in the reproduction that several proved quite opaque. Obviously if such pigments were flowed over others they would tend to obliterate them. Perform this exercise.

As a third experiment, washes of these same pigments were scrubbed with a wet bristle brush (after they had thoroughly dried) to test their resistance to water. Try this if you wish to know which of your pigments are best suited for foundation washes over which you can safely superpose others.



ANOTHER STUDENT'S CHART ORIGINALLY PAINTED IN COLORS

Observe that here the beginner tests his pigments in three different ways

We digress for a moment to point out that if the reader ever desires to work with absolutely waterproof pigments, he can turn to such colored inks as are put out by Higgins: they can be applied with brush or pen.

AN ALTERNATE EXERCISE The method used in superposing the bands of color in the upper part of Plate 6 is a bit less satisfactory than that shown at *A*, Figure 34, for the washes applied last tend to dissolve some of the foundation pigments, and so become stained by them. The emerald green in Plate 6, for example, so softened the alizarin crimson beneath that the two merged, the former becoming so neutralized in passing as to be far from pure where it crossed the other nearby bands. This difficulty is obviated in the substitute method, where widely separated stripes are carried across the sheet, each being superposed by short washes of pure pigment.

Some students prefer to experiment with pigment superposition through the crossing of single pairs of colors as illustrated at *B*, Figure 34. Many such crosses would be necessary to provide every possible combination.

EXERCISE 15: ORDER OF SUPERPOSITION At *C*, Figure 34, we discover the importance of the order of superposition. The gamboge at 1 was applied first, and was superposed, when dry, by the French blue (2), which was extended to permit a second wash of gamboge to be later passed over it (3). The blue pigment therefore both superposes, and is superposed by, the yellow. While the blue flowed over the yellow with little damage, the yellow crossing the blue streaked it. Artists troubled by getting muddy color should investigate this matter; it may prove the key to their difficulty. You should try this exercise, repeating it with many pairs of pigments.

Less valuable, yet well worth doing, is the experiment suggested by *D* and *E*, Figure 34, which presents methods of superposing three or four hues for comparison. Perform such an exercise and you will discover that neutrality or "mud" usually results from overlaying many washes of different hue, pointing to the advisability of working, when making finished paintings, as freshly and directly as possible. Direct mixture of pigments, as in the saucer,

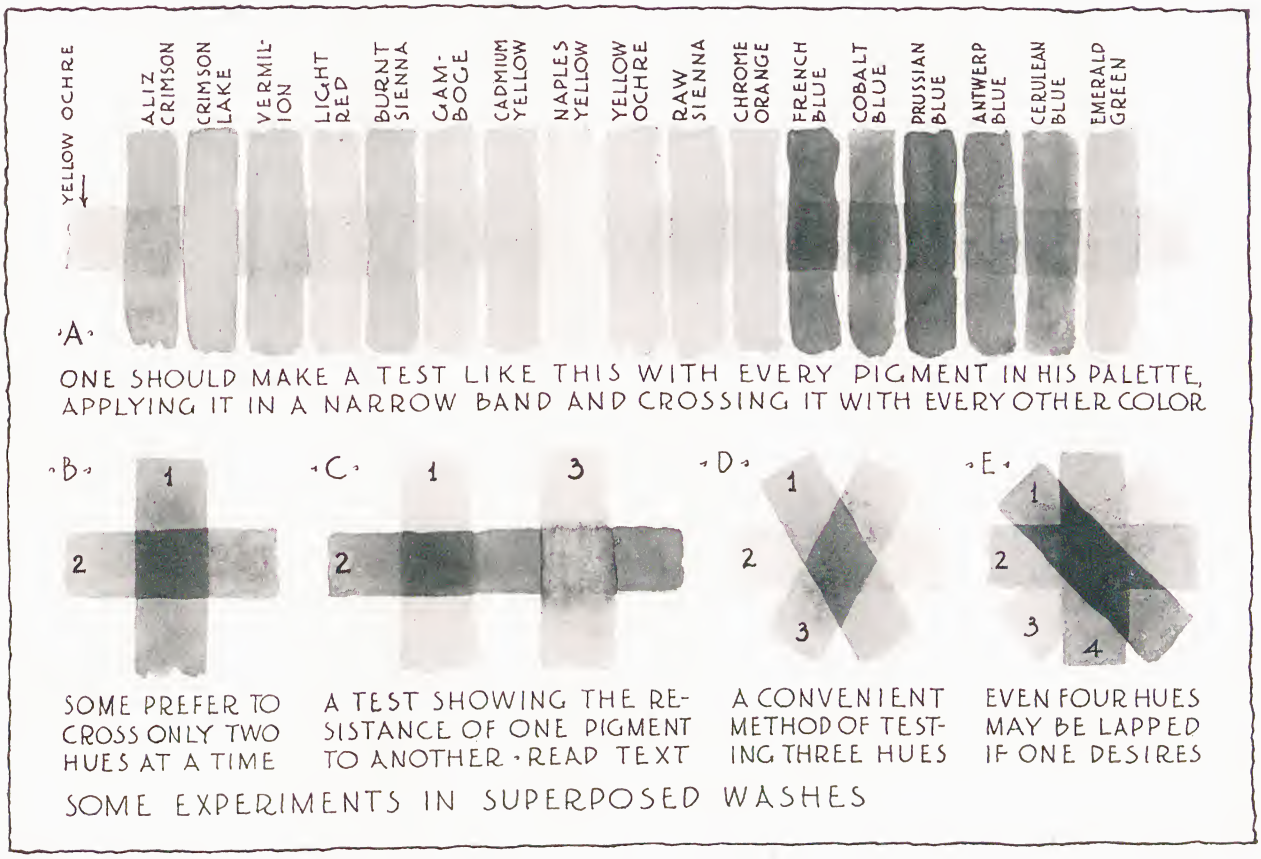


FIGURE 34

FIGURE 35

ordinarily produces clearer results than does superposition.

EXERCISE 16: COLOR MIXING In Figure 35, we show another, and most valuable, method of direct mixture. You should make many "Y" washes like that at *A*. Merely form a puddle of any desired color with one brush, and, near it, a second puddle of another color, using another brush or the first hastily rinsed. Then run the two puddles together, either in a wash, as at *A*, or, better, blended with a rotated brush as at *B*. Thus you show plainly a pair of colors and a resultant mixture; many such pairs should be combined. You can postpone this, if you wish, until Chapter IX has been read; then you will also mix groups of three and four colors, as at *C* and *D*. Such results should be saved for future reference, with the names of all colors noted. The recently described finder is useful in analysing these mixed hues.

EXERCISE 17: TEST FOR FADING To learn the resistance of your pigments to bright light you can refer to the manufacturer's catalog. It is interesting, however, to test them for yourself. On a sheet of water color paper (not board) carry a pair of broad single brush strokes of each available pigment from side to side, one in full intensity and one diluted. When dry, cut the sheet vertically into four strips, every color therefore appearing on each strip in full strength and as diluted. Write the names of the colors on at least one strip, and the dates of the test.

Place one of these strips in sunlight, as at a window, another in bright light but away from the sun, a third in a dark corner, and the last where no light can penetrate. After a year or so bring them together for comparison. Colors which then prove the least permanent can be rejected in serious work. The beginner can rest assured, while awaiting the outcome of this test, that so far as his student work is concerned, any of his pigments will be sufficiently lightproof, unless placed for some time in direct exposure to bright sunlight.

CHAPTER VII

COLOR FACTS vs. COLOR THEORIES

BUILDING A FIRM FOUNDATION FOR COLOR STUDY

Before exploring further into the field of pigment mixture we must pause for a discussion of certain basic color considerations, some knowledge of which is essential to the work which follows.

Color is so constantly in evidence all around us, that as we go about our everyday affairs we are customarily inclined, because of our very familiarity with it, to give it almost no conscious attention. We merely accept color, as we do sunshine and shadow, failing not so much in our appreciation of its beauty—for we all like color—as in a full realization of what an important part it plays in our daily lives. Color to many of us is a thing to admire consciously or openly only now and then, when particularly called to our attention, as in a sunset or a striking painting. Actually, however, even though we do not realize it, color influences us during practically every waking moment.

For though color in itself is not absolutely essential to the human race, as is proved by the fact that the achromatic vision of the totally color-blind individual apparently meets his needs fairly well, it is still true that our ability to see color all about us adds inestimably to the richness of our existence. There is undoubtedly a growing recognition of the important part which color plays in almost every branch of our emotional and spiritual lives. We are more inclined to cheerfulness on bright, colorful days than when the sky is gray. We are better contented in harmoniously colored rooms of reasonably distinct hue than in those which are drab; on the contrary, we are disturbed by interiors which are gaudy and crude. We admire clothes of beautiful color, and colorful things about us such as books, flowers, and pictures. We like the out-of-doors for its green trees, blue skies, and purple hills. Even our food is more attractive than it would be if neutral in tone.

As color adds to our happiness, this in turn adds to our health, so its effect is far reaching. Not the least of its merits is that it serves us in many practical ways. Color aids us, for instance, in identifying one object from another at a glance, as is illustrated when we go to the bookcase to select some familiar volume. It helps us to know whether fruits or vegetables are unripe, ripe, or spoiled; whether food is raw, sufficiently cooked, or overdone; whether objects are extremely hot or cold. It guides us in judging many conditions of sickness and of health. It aids us in determining comparative distances. A moment's contemplation, in short, is enough to bring to mind numerous ways in which color serves the human race. We repeat that there is scarcely a phase of existence not affected by it in some way. Color becomes so much a part of us, despite our customary lack of conscious appreciation of it, that should we suddenly become unable to distinguish one hue from another we would immediately realize our deep loss. The world would offer, instead of its accustomed harmony of many colors, much the neutrality of the uncolored photograph. It would be a gray world indeed, both figuratively and literally.

Just as color interests and pleases us today, so it apparently affected primitive man. At least, we have ample evidence of the constant use of pigments from the earliest known times. Not only was the humble home, together with its implements and utensils, embellished in gorgeous hues, but its inmates employed colors lavishly both on their clothing and their persons. The male of the species, contrary to our present custom, went forth, especially when in battle array, dressed, accoutred, and adorned in the most vivid colorings imaginable, doubtless to his own great delight, and supposedly to the consternation of his enemy.

If from this early starting point we should trace the gradual progress of mankind, we would find this same love of color manifesting itself over and over again. At the time of the ancient Egyptians, Persians, and Assyrians, for

instance, we know that color was still used in abundance, yet with an increased restraint and appreciation consistent with the development of civilization as a whole.

From these days of thousands of years ago to the present, color has continued to occupy the attention of man, who has ever sought to wrest its secrets from nature. With the advance of science, the speculation of the ancient has given way to the intelligent research and experimentation of the trained investigator. Especially during the last century or two have physicists, physiologists, and, more recently, psychologists studied the problems of light and color and the processes of vision. Nor have the chemists been idle in the meanwhile, for under them a sound advance has been made in the discovery and perfection of pigments, the colorists in various fields having done their part by putting these pigments to all sorts of uses, seeking at the same time laws regarding their harmonious application.

In view of the united efforts of so many serious investigators over so long a period of time, the student entering upon any phase of color study usually expects to find the entire subject thoroughly understood and placed on a truly scientific basis, with exact laws determined, perhaps comparable to those of music. It is often a great surprise for him to learn that, though marked progress has been made in every department of color investigation, nature still withholds many of its secrets. In fact, years may yet elapse before light itself, and color vision, which permits us to see colors all about us (for color is only a matter of vision, as we shall explain more fully a bit later), are thoroughly understood. Man, too, despite any claims to the contrary, progresses slowly in his attempts to discover definite and infallible laws regarding the concordant employment of color in such pigment forms as paints, inks, and dyes. It is more than possible that such laws may never be found.

When the student first comes to a full realization of this fact that the employment of color (whether in such representative painting as is the subject of this volume or in some other field) is not a thing which he can learn to any great extent by rule—that there are few precise and easily applied laws for his guidance—he is quite sure to wonder just how he will manage to make satisfactory progress.

A bit later we plan to offer a word of advice as to what course he should follow. Enough now to assure him that despite this condition that seems in certain aspects a bit puzzling or chaotic (or will, at any rate, by the time the next few columns have been read), his path will by no means be as difficult as he might expect. As a preliminary to this advice we now propose to present a short discussion designed to give him the background necessary for any serious approach to color study.

To Sir Isaac Newton, working in the 17th Century, is attributed the discovery that light consists of many rays, each of which, when allowed to impinge separately upon the retina of the human eye, produces the sensation of a distinct color, the fusion of all the sensations generated by the mixture of rays giving the sensation of white. Color, therefore, was shown to be a sensation—a matter of vision.

Until Newton's time it was doubtless commonly believed that color was as much an inherent characteristic or property of any object as was its shape or its texture. It is not easy for us, even now, to realize fully the established fact that the red of an apple is not an innate quality of the apple, strictly speaking, but that we merely *see* an apple as red because it has the property of absorbing some rays of light while reflecting others to the eye—a matter to which we shall presently return.

Light and color are essentially one, so the student who cares to make anything approaching a complete investigation of color should therefore lay a foundation by grounding himself thoroughly in a knowledge of both the physical facts concerning light and the physiological and psychological effects of light, and its resultant color, on the individual. He can best do this by turning to some of the recognized scientific treatises on the subject. As a single splendid volume we recommend *Color and Its Applications* by M. Luckiesh (D. Van Nostrand Company). This book not only covers many essential matters but makes numerous references to other authoritative sources of information.

In view of the availability of this and many other excellent books going thoroughly into this phase of color study, we shall offer here only a brief presentation of a few fundamental facts, stated so far as possible in non-technical terms.

Light supposedly comes from its source (for our present purposes assumed to be the sun) as a wave motion (though there is a recent theory which claims that light particles have

a spinning momentum or angular movement in addition to their linear momentum). The waves are believed to travel at the remarkable speed of approximately 186,000 miles a second! The sensation known as color, as stated above in different words, is produced by the action of these waves of light upon the optic nerve. The waves vary in length, this variation being the cause of the different hues with which we are familiar.

Newton performed a most interesting experiment in this connection which any student can easily repeat. In a darkened room he admitted a beam of sunlight through a slit in a window shade and allowed it to traverse a prism. This separated or decomposed the light into a long line of colors, imperceptibly graded one into another, similar to the rainbow. This separation of white light into its elements is called dispersion; the resulting band is known as the spectrum. The colors of the spectrum arrange themselves in the order of their wave lengths, the long waves being less refracted than the short. Starting with the red, which has the longest and slowest vibrating waves of any color visible to the human eye, innumerable colors follow, the most prominent being, in this order, red, orange, yellow, green, blue, and finally, violet, which, having the shortest and most rapid waves of any visible color, occupies a place at the opposite end. At 1, Figure 36, this experiment of Newton's is illustrated.

It is interesting to point out that these light waves which are visible to the person of normal eyesight constitute but a small proportion of all the light rays which exist. We are color-blind to waves longer than 36,000 to the inch —the approximate length of red rays—or shorter than 61,000 to the inch—the approximate length of violet rays—many others, including the infra-red and ultra-violet, being, under customary conditions, invisible.

Newton followed this first experiment of separating white light into the prismatic spectrum by a second, illustrated at 2, Figure 36, in which he passed a portion of this colored band through an aperture in another screen, permitting it to traverse a second prism. As he found no additional change of color he was convinced that monochromatic light could be no further decomposed.

Newton also demonstrated that not only can white light be decomposed into many colors, as by a prism (such experiments are often carried out today with the spectroscope or similar apparatus) but that these colors can be recombined into white light. This can be proved by impressing such colors on a second prism, or by receiving them from the original prism onto mirrors or lenses so curved as to convey them all to a single spot where they will reunite to form white.

Thus it was long ago shown beyond reasonable doubt that light is the source of color, and that white light, which seems so simple and pure, is, in reality, made up of varying rays, each capable of producing the sensation of a distinct hue. It is obvious, then, that when light is present, color is present; when light is

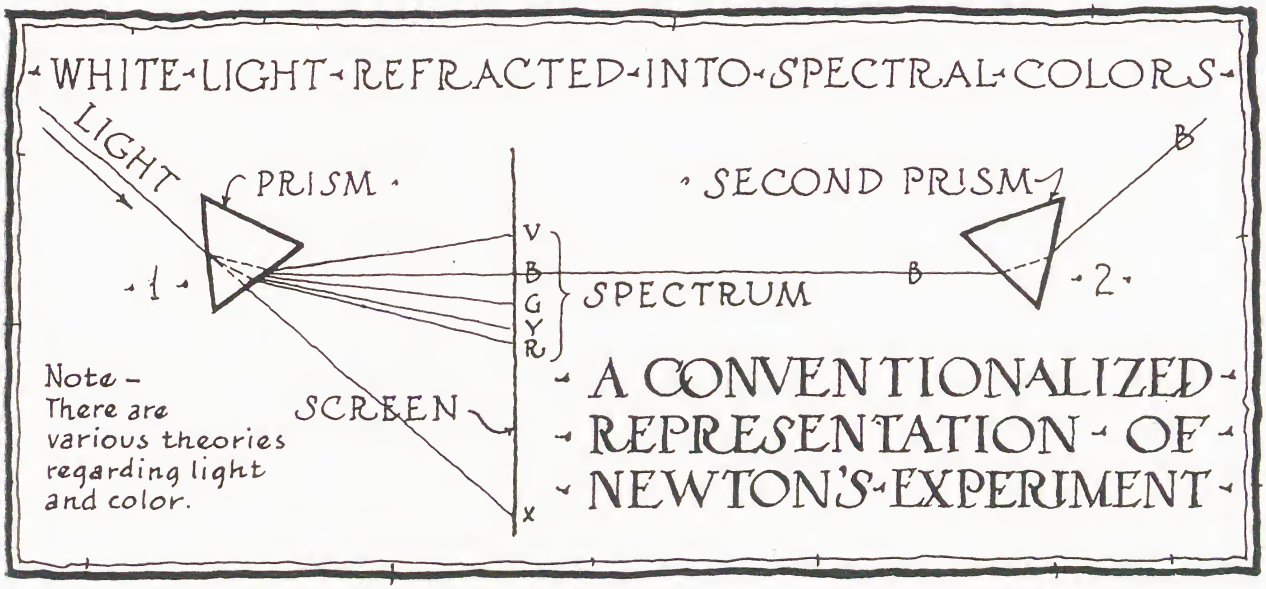


FIGURE 36

absent, color is absent. It follows, too, that the nature of light influences the nature of color; objects look different under daylight, electric light, gas light, colored light, etc. In experiments such as we have mentioned, the light from the sun is usually considered as white; actually, as it reaches us through the atmosphere, it is often far from pure.

With this as a background, let us consider why one object looks red and another green. If we glance at a given object (excepting self-luminous, fluorescent, or transparent ones which would bring us into a discussion more involved than we need enter here) we are able to see it by the light cast upon it and reflected to the eye. It is easy to understand that if the object is in strong light it reflects much light and therefore appears bright; if in dim light it reflects little and seems indistinct. It is not so easy to understand why one object appears red and another green until we learn that surfaces exercise a selective power on the light of the sun or other source of illumination, every surface decomposing the particular light with which it is illuminated, absorbing some of the constituent rays while reflecting or scattering others in all directions. (We are here refraining from any consideration of the different kinds of reflection and reflective surfaces, and from a discussion of the appearance of objects exposed to colored light.)

A red book, as it decomposes the light which falls upon it, absorbs or annihilates all the rays but the red; these are reflected, some of them reaching the eye, which instantly conveys to the brain, via the optic nerve, the sensation of red. A green book, on the contrary, has the power of absorbing all the rays but the green; these are the ones reflected. A white object is merely one which reflects a large percentage of the rays, including all colors so balanced as to give the effect of absence of color—white. A black object is one which absorbs nearly all. A gray object absorbs some rays and reflects others, doing so without disturbing the relative proportion of waves as they exist in the light illuminating the object.

Few objects appear as of a single pure color, however, or absolutely white or black—hence this description is far from complete. It is merely hoped that it states a few main truths clearly. If one desires a more complete explanation of the whole matter, such books as that by Luckiesh, mentioned above, should be consulted.

Now let us further consider our prismatic spectrum. If a prism is available the student should use it to project the spectral colors onto some suitable surface. If not, reference to the upper figure in Plate 7 will answer, though it should be realized that it is impossible to paint a spectrum, or to reproduce it with printers' inks, in anything approaching the desired intensity and purity of color. For that matter, even the prismatic spectrum is not recommended by scientists as ideal for purposes of study, but it will serve our present need, which is only to see if we can gain the impression, as early investigators did, that some spectral colors are simple, whereas others are compound. Newton over two hundred years ago selected his famous seven steps of color (red, orange, yellow, green, blue, indigo, and violet) as principal or fundamental. Other investigators thought him wrong. Sir David Brewster concluded after long experimentation with pigments and colored glasses (which obviously contained pigments) that light was made up of three primary colors, red, yellow, and blue. Because of his scientific prestige this theory is usually mentioned as the Brewster theory, though it may have been of much earlier origin. He believed that the spectrum was formed of overlapping series of red, yellow, and blue waves, with no others present.

Apparently this theory was for a time unchallenged, gaining quite general acceptance both by scientists and workers in pigments. Among its adherents was the famous Frenchman, Chevreul, whose findings, based on exhaustive experiments in color research, particularly as related to dyes (he was director of the dye department of the famous Gobelin tapestry works) still have a strong influence. Despite our improved knowledge of color in general, there is much of value to be learned about pigment application, even today, from his book *Harmony and Contrast of Colours,* published about a hundred years ago.

This general accord between scientists and colorists was not long to last, for new theories were soon propounded claiming that from a scientific standpoint red, yellow, and blue were *not* the three fundamental colors. From that time to this, various conflicting theories have been advanced, one after the other.

Dr. Thomas Young, early in the 19th Century, conceived the theory that instead of red, yellow, and blue, the true primaries were red, green, and blue (violet). According to

this theory, which was little known until more fully developed by Professor Helmholtz and Professor J. Clerk-Maxwell (we generally speak of it today as the "Young-Helmholtz" theory), there are three sets of nerves in the eye, one mainly sensitive to red, one to green, and one to blue (blue-violet). Intermediate hues would act upon at least two of these sets of nerves. Yellow rays, for instance, would affect the nerves sensitive to red and those sensitive to green at the same time, thus giving the sensation of yellow. So, according to this, yellow would not be a primary color, as in the Brewster theory, but a mixture of red and green. The sensation of white would result from equal stimulation of all three sets of nerves.

This Young-Helmholtz theory, like that of Brewster, was based on the physical mixture of color, as there was no anatomical evidence of the presence in the eye of these three sets of nerves. Instead of the pigments generally used by Brewster, however, spectral colors were mainly employed for the experimentation, or the simple mixing device known as a color top, described below. This theory, even today in the light of later theories touched on in a moment, stands up well under many tests of spectral color mixture. If, for instance, the spectrum is projected, by a prism or otherwise, onto an opaque screen arranged with fine slits which permit the red and green rays alone to pass through, these rays can be gathered or made to unite or overlap on another screen, by means of additional prisms, lenses, or mirrors, where they actually do appear as yellow, thus seeming to bear out the claim that yellow is a mixture of red and green and so not a primary. If to the yellow thus obtained, blue-violet rays are added by the same means, the result is white light. In other words, red, green, and blue-violet rays of light actually produce, in mixture, white light.

This theory was disturbing to artists and colorists generally, as it did not work out with pigments as did the Brewster theory. Attempts to mix normal yellow from red and green pigments, for instance, proved failures, so speculation became common as to whether or not pigments and light followed the same laws.

During this period, Maxwell's color top, together with its disks, was frequently employed in experiments in color mixture, and as it is a thing still in frequent use, and mentioned in almost every book on color, we shall describe it, though with the feeling that its value, at least to the student, has been greatly overrated. The kind which is most familiar can be obtained for a few cents from any of the school supply houses, such as the Milton Bradley Company, Springfield, Mass. It consists of a simple wooden top of spindle type, together with disks of colored paper, each with a hole in the center to fit over the spindle. In order to permit the combining or mixing of two or more colors, each disk is slit radially from center to circumference, allowing the selected disks to be fitted together and adjusted to show the colors in any wanted proportion. By means of rapid spinning an effect of mixture is obtained through persistence of vision; if two or more colors are placed on the top and rotated they merge to appear as one. This is a most fascinating little device, and by its use colors can be blended to produce innumerable hues. The author's objection is that it seems to prove little which the student can apply to his work with pigments. If he mixes normal blue and normal yellow, expecting to get green, he is disappointed, this seeming to disprove the Brewster theory. On the contrary, if he mixes normal red and normal green, hoping for anything approaching normal yellow, results are hardly more satisfactory, so the Young-Helmholtz theory is not substantiated. This is confusing, for the results are unlike those obtained by the other usual methods of mixing either pigments or spectral hues. Therefore, though the top is claimed to have many advantages—see Luckiesh in his *Color and Its Applications* and Sargent in *The Enjoyment and Use of Color*—we see no point in its general employment.

Returning to our main thought, we should make it plain that physicists, using light rather than pigments as a basis of experimentation, came to agree years ago that Brewster was wrong in his claims and today quite generally accept and teach that red, green, and blue-violet are the true primaries; see, however, the brief reference to more recent theories a bit further on. On the other hand, the physicist would be the last to deny that when pigments are used these Young-Helmholtz primaries which prove out with pure light do not give convincing results. It is impossible through pigment mixture, for instance, to obtain a yellow of full intensity from red and green; on the other hand, nearly every known hue of green with the exception of a brilliant emerald

can be approximated by mixing clear yellow and blue, just as Brewster claimed. Because of this fact, the old Brewster primaries, red, yellow, and blue, though now admitted to be false in problems involving the mixture of pure light, are quite commonly accepted as the primaries in pigment mixture. No one would now claim Brewster right, however, in thinking that the solar spectrum was formed by the overlapping of red, yellow, and blue waves, with no others present.

Today the physicist understands the reasons why pigments cannot give the same results in mixture as do spectral colors, yet it seems hardly necessary to go into them here. We might point to the single fact that when one spectral hue is added to another, light is added to light (brilliancy to brilliancy), so, when all the spectral hues are merged, the result is bright, pure light. When a pigment of one color is added to a pigment of another color, however, each pigment having absorbed or annihilated some of the light illuminating it, dullness is, in a sense, added to dullness, the final mixture of many pigments always being gray and not white.

To sum this up, much that can be proved about light cannot be proved about pigments. *The same laws do not apply and cannot be made to apply to both.* On the contrary, the differences in results obtainable through experimentation with light and with pigments are so many and so marked that it seems difficult to understand why teachers and writers on the subject of color, approaching it from the standpoint of the colorist, so often try to reconcile them. We can appreciate the refusal of the present-day scientist to accept pigments as the basis of his color experimentation; why, then, should not the artist be as reluctant to use light? Each has his own medium and his own requirements.

Once the student realizes that spectral hues and pigment hues do not follow the same laws, there are two main courses of study from which he can choose.

First he can, at least for the time being, turn his back on all the puzzling things the scientists are discussing, and, accepting a few facts of proven worth such as we outline here, employ them as a basis for pigment experimentation, gradually learning to know color through using pigments in attempts to represent such effects of color as he sees about him. He will try to analyse color appearances, in other words, and endeavor to express them with his pigments through painting and painting and painting. He will not mind the ill repute into which the Brewster theory has rightfully fallen among scientists, so long as he can profit from such of its premises as prove out with pigments. Let him hold to his red, yellow, and blue as primary, if he wishes, adding to them such other hues as seem to him most essential, according to his individual requirements. Then let him experiment with these pigments, following such progressive exercises as we offer in this volume, secure in the knowledge that whatever he learns of color from such experimentation can be utilized later in all his color problems.

The man who thus elects largely to ignore the findings of the scientists, turning immediately to practical experimentation with brush and paint, can do so with the assurance that he is following in the footsteps of a vast host of individuals who have successfully pursued a similar course before him. For even of the acknowledged experts in the field of color—experts who attribute no small part of their success in such professions as painting, architecture, interior decoration, and industrial design to their ability to use color well—many a man has acquired his grasp in what might seem an extremely haphazard manner, picking up an idea here and another there, experimenting, comparing, and analysing over a long period of time (perhaps with pigments, though possibly with building materials, fabrics, etc.) until he has accumulated a fund of color facts and developed an indefinable feeling for color —increased sensitiveness to and appreciation of it—which grows and changes with the years.

The second course open to the student is more difficult than the first, particularly if he is young or impatient. Certainly it is far less commonly followed. For before starting with pigments at all he would make an effort to ground himself thoroughly in the fundamentals of science as they relate to light and color. He would investigate such theories and opinions and laws as we have touched upon, which involves reading many books (and doing some acute thinking as well) for we have introduced our reader to only a few of the intricacies and complexities of the subject. Take the matter of color theories as an example to show how involved this whole thing is: the earnest student will soon discover that even the Young-Helmholtz theory, previously

mentioned as generally accepted and taught, by no means meets with complete and unqualified approval. Many other competing theories have been conceived. There is the "Duplicity" theory, chiefly associated with the name of Von Kries, the Hering theory, the Ladd-Franklin theory, the Eldridge-Green theory, and several more. The Hering theory is interesting in that it advocates six fundamental color sensations instead of three, the six being in pairs—black and white, red and green, and blue and yellow. Yellow therefore once more becomes a color of the first order. The Ladd-Franklin theory seems to be growing in favor, having the endorsement of many eminent authorities. Dr. Ladd-Franklin's book *Colour and Colour Theories* fully describes it, comparing it with others.

It is evident that the student who conscientiously follows this latter course will have quite a delay before he gets to his consideration of pigments: even then he will have acquired little knowledge directly applicable to his daily problems; he must still experiment and experiment, as every artist does. His scientific knowledge may even deter him from painting in the bold, free manner which is generally productive of the finest results. Perhaps the best move of all is for one to compromise by combining these two courses, with emphasis mainly on pigment practice. It seems hardly wise to risk, just at first, the mental indigestion which would be almost sure to follow any attempt to straighten out at once all the tangle of seemingly irreconcilable theoretical and practical matters. Possibly the beginner would do well to go ahead with his exercises with pigments for some time, undisturbed by anything else. Pictorial representation being mainly imitative, and taking its color schemes largely from nature, can be done successfully with little or no knowledge of the laws of light and spectral color. Later he could investigate such of these laws as his pigment practice brings to his attention or his individual requirements seem to demand. He will need increased scientific knowledge if he turns to such forms of creative art as involve the direct use of light itself—leaded glass and lamp shade design, for instance. Stage lighting and window display work are extremely complex, light and pigment being employed in combination. This volume, in guiding him through his practical work with pigments, directs attention now and then to some of the contacts which he can advantageously make between the two fields of art and science.

Whatever course the student adopts at first, it is quite likely that he will eventually find himself anxious to explore some of the theories and laws of the scientist; even those which prove impractical to him will at least enrich his general knowledge and appreciation of color. If one fails to investigate this scientific material he is almost certain to deprive himself of a wealth of adaptable suggestions which have been developed during centuries of intelligent and conscientious research on the part of many earnest workers approaching the subject of color from every possible point of view. The longer one studies the more he comes to realize, too, that some theories or laws, which on first comparison seem as far apart as the poles, actually are, at least when it comes to their practical application, parallel rather than divergent; one who studies them thoroughly will find that they lead him in the same direction, which is straight ahead.

CHAPTER VIII

HUES, VALUES, AND INTENSITIES

THE COLOR QUALITIES AND THEIR MEASUREMENT

Despite our aim to keep this volume as free as possible from technical terms, some, including "hue," "value," and "intensity" have already crept in, and as we approach exercises in which these and related terms must of necessity be employed with increased frequency, it becomes imperative to offer a few definitions and explanations. We shall confine ourselves, however, to the vocabulary of the artist, ignoring that of the physicist.

QUALITIES OF COLOR If we look at any given color analytically—the red of an apple, for instance—we discover that it possesses three outstanding characteristics or qualities.

HUE First, there is that quality by which we recognize one color from another, and which we suggest by its name. This we call "hue." The apple is red; red is the hue (or name) of the color. Remember the equation "Hue = name."

We can alter the hue of a color by mixing another color with it. If we mix red pigment with yellow pigment we produce orange pigment; this is a change in hue.

VALUE Next comes the quality by which we discern lightness or darkness in a color; this we call "value." It is by value that we are able to discriminate between light red and dark red.

By mixing a color with something lighter or darker than itself we change its value. If we mix black or white (water, in the case of water color pigments) with a color we change its value but not its hue.

Normal Colors, Tints, and Shades A color in its full, natural strength may be called a "normal" color or a color of "normal" value. If lighter we call it a "tint"; if darker, a "shade." These latter terms are so often abused that some authorities prefer the substitution of the word "value," as "a light *value* of blue" rather than "a *tint* of blue," or "a dark *value* of green" rather than "a *shade* of green." "Tone" is a word of such ambiguous meaning that it is best to employ it only in a general way to include all normal colors, tints, and shades.

INTENSITY OR CHROMA The third quality of color relates to strength. Some colors are strong and some weak; the quality by which we distinguish between them is called "intensity" or "chroma." If we remark that an object is colorful or strong in color we refer to its intensity.

We can change the intensity of a normal color by mixing with it something which tends to dull or gray it. We can change intensity without changing value or hue by the addition of neutral gray of equal value.

TERMINOLOGY Of the two terms "intensity" and "chroma" we give preference here to the former, as it appears to be in more general use. Munsell, however, condemns it as misleading, recommending the latter. (See *A Color Notation* by A. H. Munsell, published by George H. Ellis Company, Boston.)

Though this particular difference is of slight consequence to the average artist, it serves here as a means of directing attention to the unfortunate confusion of terms which exists in the entire field of color. Take, for instance, the matter of color names. Of these there are literally thousands (see *A Dictionary of Color* by Maerz and Paul, published by the McGraw-Hill Book Company, N. Y.), with new ones invented every day. Few are truly descriptive. There are colors named for flowers or plants, such as rose, violet, and indigo; for fruits, including orange, plum, peach, and lemon; for places—Antwerp blue and Nile green; for persons—Hooker's green, Payne's gray, and Rembrandt's madder. The inadequacy of such terms is evident, as Munsell expresses so aptly when he says, "Can we imagine musical tones called lark, canary, cockatoo, crow, cat, dog, or mouse, because they bear some distant resemblance to the cries of those animals?"

Aside from color names, there are many other color terms equally ambiguous or un-

standardized, such as those just presented in our description of color qualities. The scientists wrangle over one lot of words and the colorists over another, and neither group has developed an exact or universally accepted terminology, comparable to that of music. So, despite the wealth of color terms, it is extremely difficult for one to put in words a description of a color scheme, or even an individual hue, with any likelihood of being exactly understood.

COLOR MEASUREMENT This does not mean that no attempts have been made to bring order out of this chaos, for the problem has long been evident and steps towards its solution have often been undertaken.

First, it has been demonstrated that the color qualities which we have described as hue, value, and intensity are measurable, each of them being really a dimension. Color, in other words, is a three-dimensional thing.

Secondly, though no one color yardstick or system of measurement meeting with anything approaching universal acceptance or application has been devised, several most ingenious ones have been presented for consideration. For a comparison of some of these, see the chapter, "Color Terminology," in Luckiesh's *Color and Its Applications.* We shall make no effort to describe them here or weigh their relative merits, for as Luckiesh himself points out, "There is much yet to be done before a system of color notation is devised which will be universally adopted."

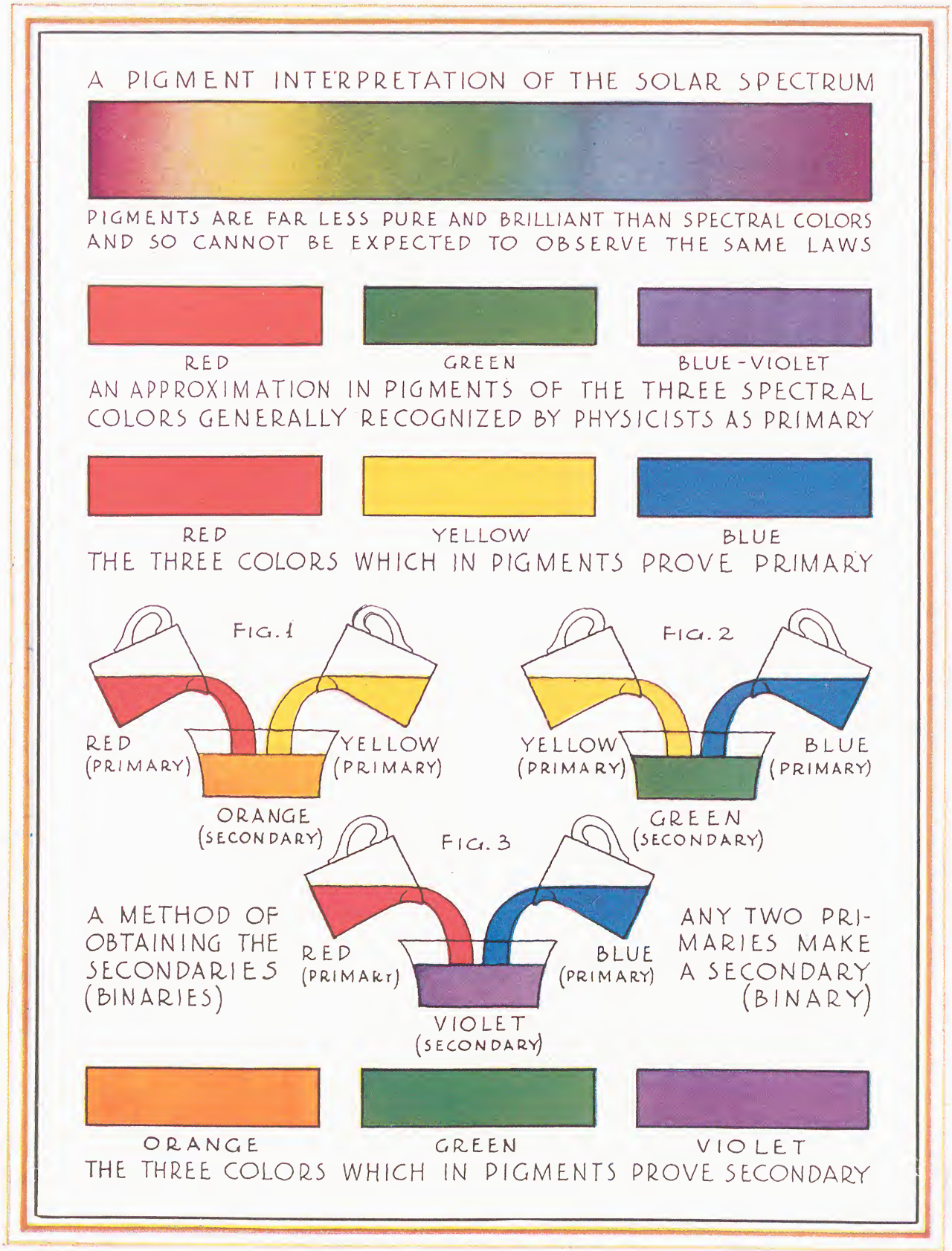
TEXTURE Even if the time does arrive when this problem is solved, the solution is bound to be of somewhat limited value when it comes to practical application where pigments are involved as in the work of the representative painter. For we have seen that the artist's concern is less with color in the abstract than with pigments, and is used not in the representation of pure spectral hues, but for picturing objects of all sorts as they appear to the eye. And these objects, as well as the pigments, convey color impressions modified by what, for want of a better term, we call texture. It is largely by texture—whether a mere surface texture or a surface revelation of deeper seated physical characteristics—that we know whether a thing is of metal or cloth or wood or plaster. If fabrics of silk, cotton, and wool, originally white, are dyed with the same dye, they can still be identified through their textural characteristics.

Texture, therefore, though not truly a quality of color, as are hue, value, and intensity, is so closely related to these qualities that it must be considered along with them. If one paints an object he must keep in mind its shape and character as revealed by its color (hue, value, and intensity) and texture. The light and shade on objects can be thought of as agents for the expression of shape and texture, and as modifiers of color.

The artist has long realized this truth that to portray his subjects properly he must express texture together with color. He even selects and employs his materials—papers, pigments, etc.—accordingly. Architects, decorators, and designers know of the importance of textures, too, choosing all such things as building materials, fabrics, and finishes with them in mind.

This brings us to another point of interest. The exponents of some of the systems of color measurement have made the claim that a designer in New York could work out a color scheme, say for a room interior, which could then be measured by their instruments as to hue, value, and intensity, and a notation of the colors telegraphed to California, where the work could be successfully executed in the absence of the designer, and without any actual samples. Even if we grant the contention that hue, value, and intensity can be so measured and transmitted, there is still grave doubt whether the final work, if executed from such measurements alone, would have the intended character, for in all such problems much depends on texture, as we have seen, and *texture is immeasurable.* Don't forget this point, for it's the climax of our present discussion.

This is not advanced as an argument against color systems; it is simply an effort to make the student realize that, no matter to what extent such systems may be perfected, in the final analysis his eye, and his eye alone, will be his instrument of color judgment. He must learn color mainly through observation of natural colors, and through the use of color in pigment form: for this reason we shall place great emphasis, as we go along, on experiments with pigments, organized for his own performance. He should not neglect them.



A GRAPHIC DEMONSTRATION OF THE ELEMENTS OF PIGMENT MIXTURE

The student should perform like experiments with his own paints

CHAPTER IX

MAKING AND USING COLOR CHARTS

PRACTICAL HINTS ON MIXING AND MATCHING COLORS

In spite of the limited value of the complete systems of color measurement so far devised, as they relate to the everyday problems of the artist, simple color measurement scales such as we present in this chapter are useful in many ways, not only as permanent references, but also because one who makes them acquires numerous practical pointers which he is unlikely to gain by any other means.

PIGMENT MIXTURE If you experimented with your pigments, as directed in Chapters V and VI, you doubtless discovered that, whether you mixed them by superposition or by merging them on paper in "Y" washes or even directly in your saucer, the results indicated that pigment mixture follows natural laws. It is our present intent to offer a series of exercises designed to reveal the best established of these, while at the same time providing simple scales for color measurement.

You have seen (Chapter VII) that the laws of the scientist which govern the mixture of color in the abstract—light—are of little use when it comes to mixing pigments. You know that the solar spectrum (as projected onto a screen by means of the prism) is extremely brilliant. It is light itself. If you try to represent this spectrum with even the purest pigments obtainable you cannot approach its intensity. Each of your pigments absorbs many of the rays of light which come in contact with it and tends to reflect portions of hues other than the dominant one. Your white paper reflects only a little more than half of the light which falls upon it. Naturally, then, any pigment interpretation of the spectrum is bound to be a comparatively dull and lifeless thing (see Plate 7).

You understand, too, that of the various spectral hues, red, green, and blue-violet can be classified as primary (Plate 7), for from these three all other spectral hues can be mixed. These primaries, in properly balanced mixture, also produce white. But, in dealing with pigments, approximations of these spectral primaries do not prove primary: if you mix red and green, for instance, you get gray in place of the yellow which would result from spectral mixture. You cannot mix normal yellow from any other pigments. You cannot mix white from any combination of colors. Which brings us again to the vital fact that *the mixture of spectral hues and of pigment hues do not follow the same laws.* If this brief statement, or the exposition in Chapter VII, is not clear, you can find a thorough and authoritative explanation in the chapter on color mixture in Luckiesh's *Color and Its Applications.*

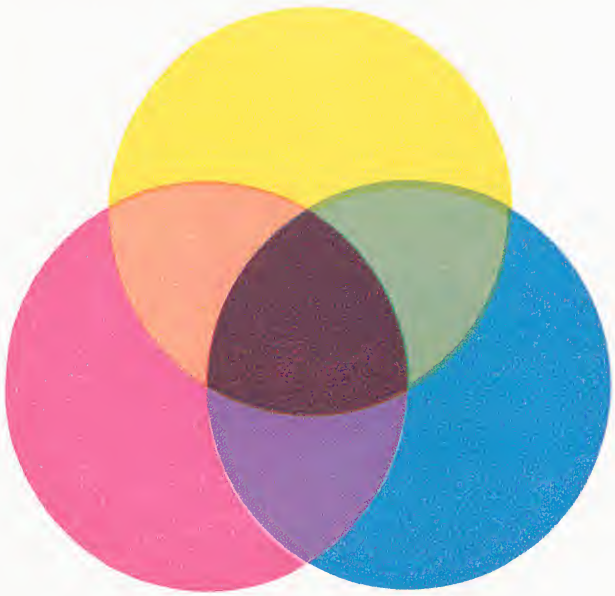


FIGURE 37

As already stated, we shall therefore say little more about the mixture of spectral hues, confining our discussion to things which prove out with pigments, for these are the tools of the artist, on the intimate knowledge of which his success largely depends.

PIGMENTS Though one's regular paints will do for the following exercises, many educators prefer brighter colors such as those known as "Schmincke," distributed by M.

Grumbacher, 460 West 34th Street, New York, and sold by dealers almost everywhere. These are available in various sets, that of twelve colors arranged in the form of a color wheel being ideal for the present purpose. Our own charts are much less brilliant than can be made with these Schmincke colors.

PRIMARY COLORS Various authorities select different pigment colors as primary. We shall base our experiments on the scientifically discredited, but practical, red, yellow, and blue of Brewster. We have made clear that from these three almost any desired hues can be mixed. They are used by many colorists, including the printer, painter, and dyer. The exact hues selected as primary differ according to purpose. All the color printing in this book was done with the three inks shown in full strength (and as mixed by superposition) in Figure 37, plus a bit of black to give deeper values. As the printer's problems in pigment mixture are practically those of the artist, these very hues could well be selected by the latter for his primaries. Plate 7 shows less intense hues such as are used in many color charts where one's regular pigments are employed. The main thing is to utilize the reddest red, the yellowest yellow, and the bluest blue that one's palette affords.

EXERCISE 18: MIXING THE SECONDARIES When you have selected your primaries, the next move is to mix "secondaries" from them. Plate 7 makes the method clear. In Figure 1, for instance, we see a diagrammatic interpretation of the mixture of red and yellow by pouring them from transparent pitchers to produce orange below. You can actually mix your pigments by this method, if you choose, though by resorting to the "Y" washes already described you can preserve the results. See Figure 38, which shows a convenient arrangement for Exercises 18 and 19. In addition to the "Y" shapes you will note the rectangles for supplementary washes of the same colors, mixed in the saucer for greater accuracy. By varying the proportions of your primary red and yellow you can obtain a full range of oranges; choose for your secondary the one which seems to stand midway between your red and yellow.

Figure 2, Plate 7, demonstrates a similar mixture of primary yellow and primary blue to produce green, our next secondary hue. By varying the amounts of yellow and blue, almost no end of greens can be obtained. Choose

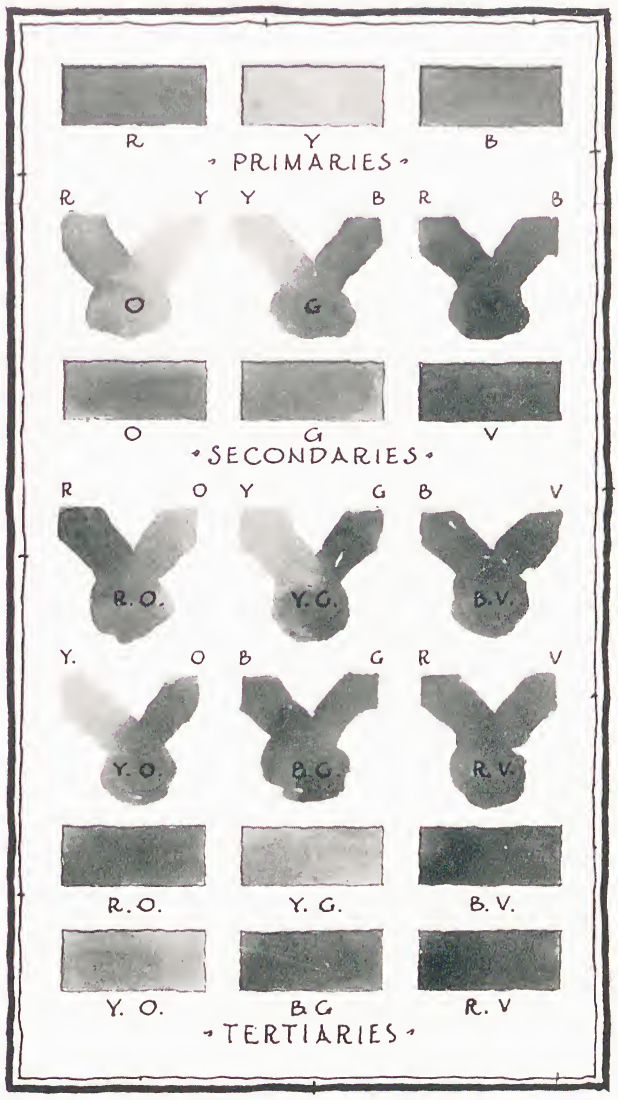


FIGURE 38

for your secondary hue the green which seems to stand midway between yellow and blue.

In Figure 3, the same experiment is repeated with the remaining pair of primaries, red and blue. Again choose the midway violet as a secondary.

These three secondary colors—orange, green, and violet—are shown grouped at the bottom of Plate 7. Together with the three primaries they give us six leading colors.

Before going on, it seems best to point out that some of the colors in the author's charts, including this secondary green, have printed disappointingly dull, due to the limitations of the reproductive process. With your own pigments (especially if you choose the Schmincke colors) you can get far better results.

Some books say, in substance, that "by mixing equal parts of primary yellow and primary

blue, secondary green is obtained." This is not always quite true. For yellow, though extremely intense, is light in value while blue is dark but less intense. In equal mixture, therefore, one may outweigh the other, the result not seeming a normal green. Vary your proportions as necessary, but try to get a normal green. Do the same with your other pairs of primaries.

EXERCISE 19: MIXING THE TERTIARIES Now, guided by Plate 8, which is self-explanatory, push your process another step, mixing your primaries and secondaries to produce the six "tertiaries"—red-orange, yellow-green, blue-violet, yellow-orange, blue-green, and red-violet. (In compounding these names, as "red" with "orange" to make "red-orange," that of the primary is usually placed first, indicating an excess of red over the other component primary, yellow.)

If we mix certain pairs of primaries and secondaries, as red with green, orange with blue, and yellow with violet, we produce, instead of tertiaries, grayish tones: we shall speak of this a bit later.

There would be little point in continuing this mixing exercise beyond this tertiary stage, though one could, of course, mix quaternaries, quinaries, etc.

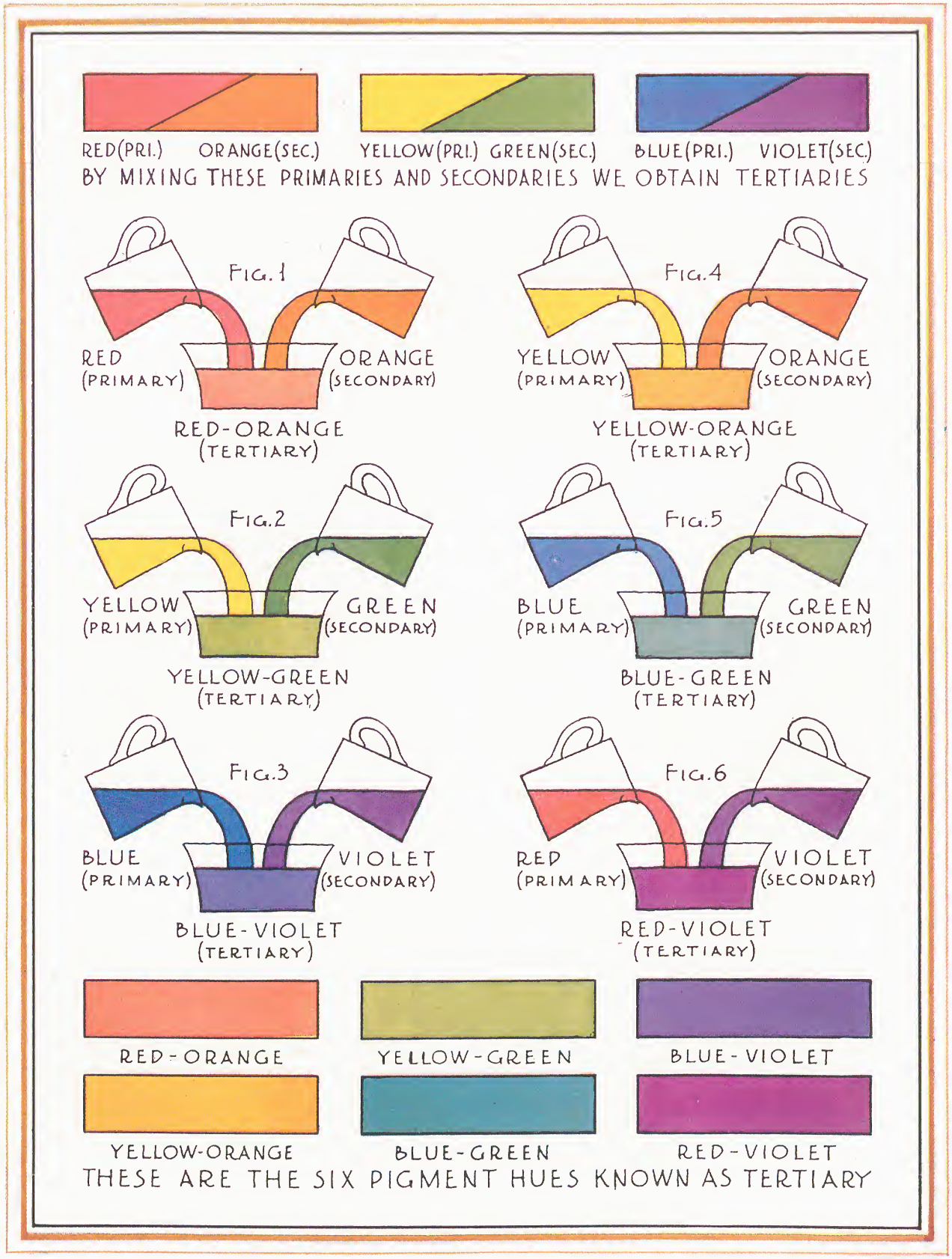
EXERCISE 20: MAKING A COLOR WHEEL Experimenters in the field of color have invented an extremely valuable device commonly known as the "color wheel" or "chromatic circle." It is really a simple scale for "measuring" hues. You should make one of your own to save for future use. Plate 9 is offered for your guidance. Though there is no arbitrary rule as to number of colors, a twelve-hue wheel is convenient as it exactly accommodates the three primaries, three secondaries, and six tertiaries. Follow the steps shown as Figures 1, 2, and 3 (your own colors will be brighter) and you will have a completed wheel not unlike that in Figure 4. A convenient size is 6″ or so in diameter.

When we say that such a wheel is a scale for measuring hues, we by no means classify it with the scientific apparatus designed for this purpose. The approximate "measurement" of any hue can, however, be quickly judged by the eye if the hue is referred to the hues of the wheel for comparison. The more hues a wheel bears, the closer this judgment will be; hence some teachers prefer wheels with eighteen or twenty-four hues; see Figure 5.

We have spoken of the color wheel as an invention. It has something the appearance of the solar spectrum, bent round to meet end to end. Actually, however, the two ends of the spectrum have little in common. It will be recalled from Chapter VII that red, which terminates one visible end, has waves which are long and slow in vibration, while the waves of violet, terminating the opposite end, are short and rapid. When we try to force these ends together, as in the color wheel (we have to add purples to fill the gap), the result is highly artificial. A well prepared wheel can prove extremely useful, however, as we shall see in a moment.

COMPLEMENTARY COLORS Chapter VII showed us that when an object, such as a red book, is exposed to light, it reflects to the eye rays of light which are capable of exciting the sensation of red. It annihilates or absorbs all other rays. Thus color is often produced, or made visible, through this power which objects have (commonly known as "selective absorption") of separating or subtracting some colors from light as a whole. The color of the absorbed light is said to be "complementary" to the remaining light, for the absorbed (colored) light plus the residual (colored) light would produce, in mixture, white light. As this absorbed or complementary light is, in the case of an object, invisible, it cannot be studied, but the scientist has learned not only how to decompose white light into its component parts (as we have seen), but how to present to view the complement of each spectral hue. If we take the three primary colors (remember we are dealing with light, just now, rather than pigments) he can show us that red (scarlet vermilion) has for its complement blue-green (cyan blue); green has purple (magenta); blue-violet has yellow (slightly orange). He can demonstrate, too, the fact already mentioned that if these spectral primaries are mixed in proper proportion white light results. It is also true that if each of these primaries is mixed with its complement, white light will result. In fact, any spectral color and its true complement give white light.

(Those of a scientific turn of mind will be interested to know that the so-called "additive" primaries of light—red, green, and blue-violet—have as their complements the "subtractive" primaries, blue-green, magenta, and yellow, which approximate the pigment pri-

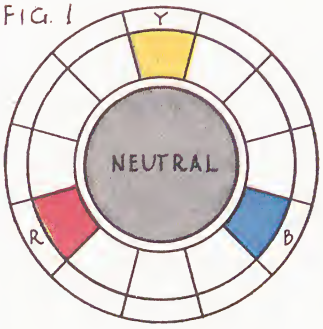


A CONTINUATION OF FUNDAMENTAL PIGMENT MIXING EXERCISES

Similar mixtures should be made by every student with his own paints

PREPARING A COLOR WHEEL (AS A SCALE OF HUES)

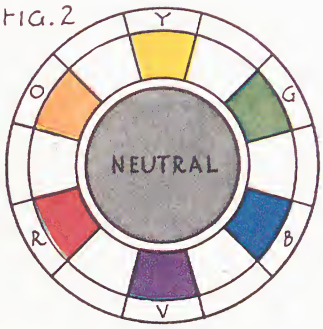
FIG. 1



STEP 1

THE WHEEL DRAWN AND THE THREE PIGMENT PRIMARIES APPLIED TO IT

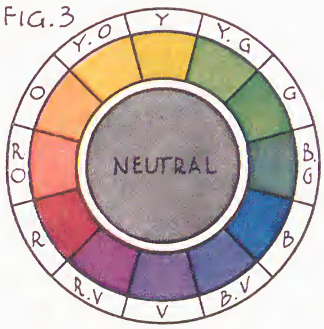
FIG. 2



STEP 2

THE THREE PIGMENT SECONDARIES ADDED TO THE THREE PRIMARIES

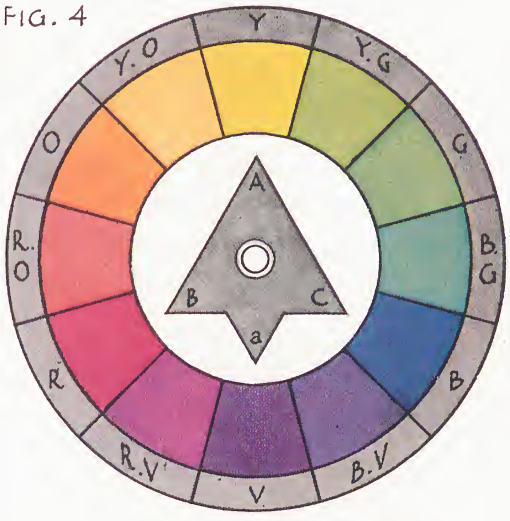
FIG. 3



STEP 3

THE WHEEL COMPLETED THROUGH THE ADDITION OF THE SIX TERTIARIES

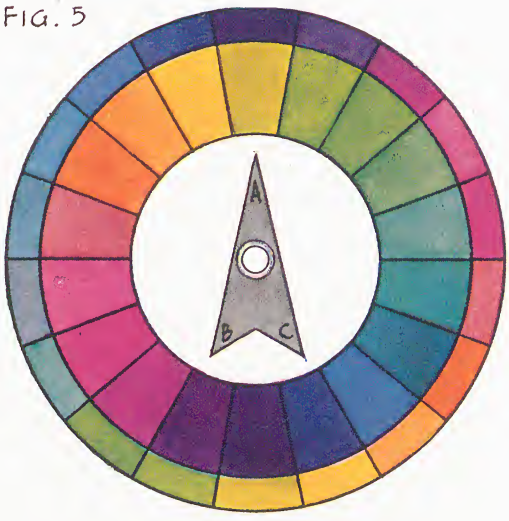
FIG. 4



A COMPLETED WHEEL SHOWING TWELVE HUES

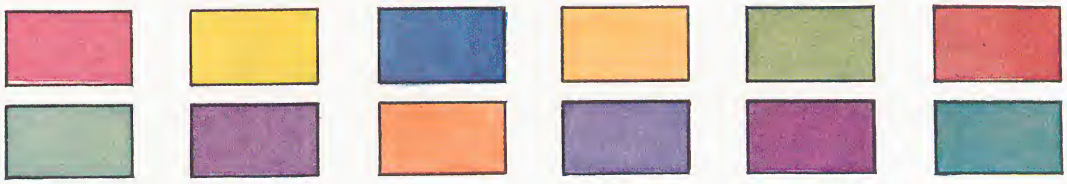
NOTE DEVICE FOR THE LOCATION OF COMPLEMENTS AND TRIADS

FIG. 5



A SIMILAR WHEEL USING EIGHTEEN HUES

SHOWING ALSO A SIMPLE MEANS OF DETERMINING SPLIT COMPLEMENTS



SIX TYPICAL PAIRS OF COMPLEMENTS

THIS INVENTION AFFORDS A SIMPLE MEANS OF MEASURING HUES

The student should make one, using far brighter pigments than here

maries blue, red, and yellow. See Luckiesh.)

This repetition of truths concerning pure light would be irrelevant here were it not for the fact that from them certain valuable parallels can be drawn. If we mix together our pigment primaries, for example, we get, in place of the white produced by spectral mixture, gray—this difference being mainly due to the dullness or impurity of pigments in relation to light. Note that we have used a neutral gray in filling the centers of the wheels on Plate 9. More about this later.

In dealing with pigments, we can find complements much as with light. Here is one method. By mixing primary red with primary blue we obtain a secondary, violet; this is the complement of the third primary, yellow, and vice versa. In other words, *the secondary obtained by mixing any two primaries is the complement of the third primary.*

It follows that if we mix a primary with the secondary which is its complement the result will approximate neutral gray, for as the secondary is made up of the other two primaries the three primaries are actually being mixed. Further (and this is the wonder of the color wheel to which we have been leading), *any hues exactly opposite on a well prepared color wheel are complementary.* This comes down to earth. We have something tangible.

DEVICE FOR LOCATING COMPLEMENTS You should provide your color wheel with a movable arrow or pointer to help in locating complements. See Figure 4, Plate 9. If the point *A* is directed towards any given hue, the opposite point, *a*, will reveal the complement. At the bottom of the plate are the six pairs of complements which this arrow discovered on Figure 4. In Figure 5 an extremely practical thing has been done, for all the pairs of complements which this wheel exhibits have been brought side by side for direct comparison.

IMPORTANCE OF COMPLEMENTS However lightly you may have taken such portions of our discussion as border on the scientific, we cannot over-emphasize the great place which these complementary hues have in work with pigments. You should memorize the principal pairs. The twelve-color wheel gives us red and green, yellow and violet, blue and orange, yellow-orange and blue-violet, yellow-green and red-violet, and red-orange and blue-green.

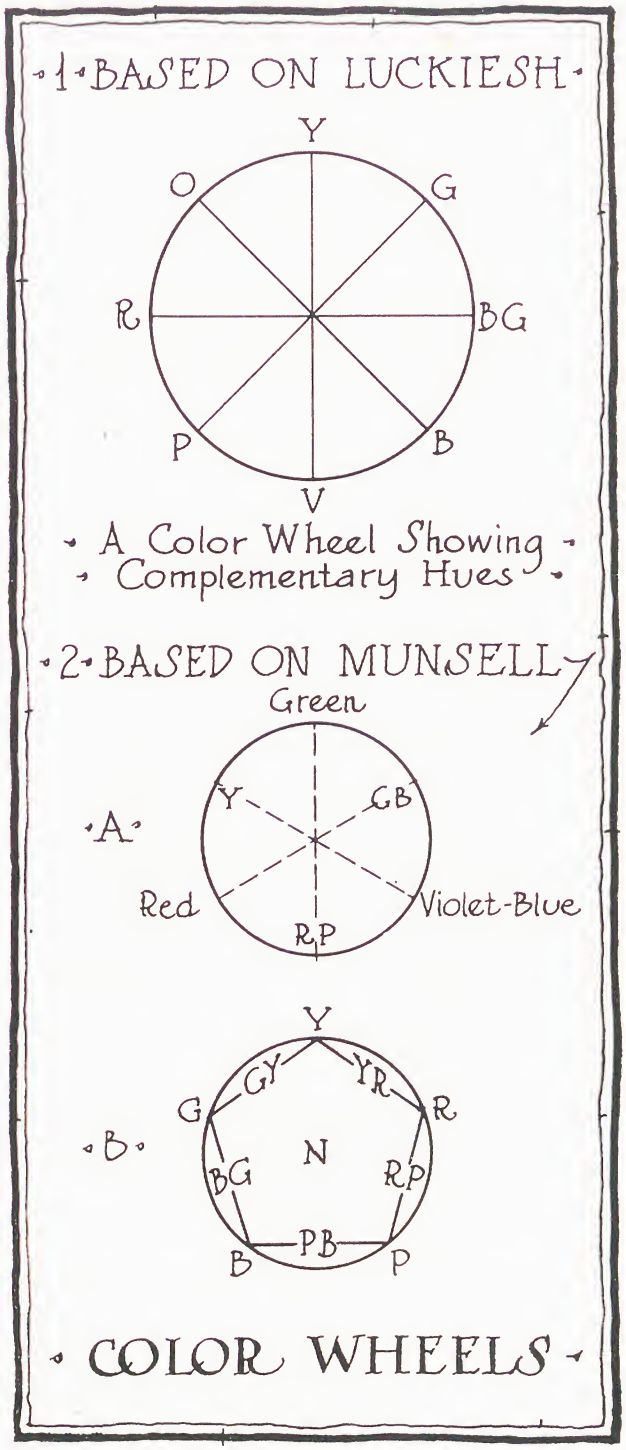


FIGURE 39

SOME OTHER COLOR CIRCLES Though our present wheel should serve all our needs, there are other types, so we sometimes have apparent discrepancies as to exact complements. At 1, Figure 39, is a wheel from Luckiesh. This is based on spectral hues. The spectrum from red to violet is arranged around the circumference, the gap previously touched upon being filled with purple. The wheel

shows yellow and violet (probably blue-violet) and orange and blue as complementary pairs, much as in our previous wheel, but red has as its complement blue-green rather than green, and green has purple (magenta) in place of red. At 2 we have a pair of wheels by Munsell. Study these in comparison with our own, although they, of course, mean little without their designer's explanation. In the author's opinion such divergencies as these wheels present are of minor importance; it seldom matters whether the student uses exact or near complements.

EXERCISE 21: TESTING COMPLEMENTS It is extremely practical for one to experiment with his own pigments to see which hues prove the most nearly complementary. Plate 10 demonstrates methods of proving complements by neutralization, the six complementary pairs shown at the bottom of Plate 9 having here been united both by direct mixture and superposition as a test of their neutrality in mixture. Repeat this exercise for yourself, substituting the "Y" washes for the vessels here shown. Comparing your grays, it is easy to judge in what respects the selected pigments fail. If the grays are too warm (brownish) the cooler colors (blues, etc.) are not strong enough, and vice versa. On the whole, such "grays" usually lean a bit towards brown.

Analysis of Plates 8 and 10 shows us that when a primary, such as red, is mixed with a related secondary (near it on the wheel), such as orange, the result is another intense color. On the contrary, if we mix the primary (red) with the secondary opposite it on the wheel (its complement green), we obtain, not an intense tertiary but approximately neutral gray.

A STRANGE PARADOX This introduces us to the strange paradox that *when a color and its complement are mixed together, each tends to dull or neutralize the other, but when placed side by side each emphasizes or accentuates the other.* Thus complements have the power both to destroy and to reinforce, according to how they are employed.

USES OF COMPLEMENTS Let us examine this destructive characteristic and see of what use it is. Suppose you have mixed a wash of orange and it is too bright for your purpose. Mixing it with water will make it lighter, not duller. How can you modify its intensity? By adding gray? Yes. But water colorists as a rule object to the use of gray as it often proves a deadening influence. Instead, add complementary blue. In the same way, if you have painted a green hillside and it seems too vivid, superpose it with a pale wash of red or red-violet.

As an example of the reinforcing characteristic of complements, suppose an artist is painting a building in bright sunshine. In order to make his sunny yellows and oranges all the more telling, he will oppose them with blue or violet shadows, which, through contrast, will enhance the brilliancy of the warm tones. In a landscape mainly of greens, a dash of red is frequently added to intensify the whole. Corot's paintings often exemplify this point.

COLOR SCHEMES Nature makes much use of complements or near-complements. We see stretches of yellow sand contrasting with the blue of sea and sky, and purple clouds against the golden sunset. Artists have long recognized the value of such contrasts and base many of their schemes upon them. More about this in a coming chapter.

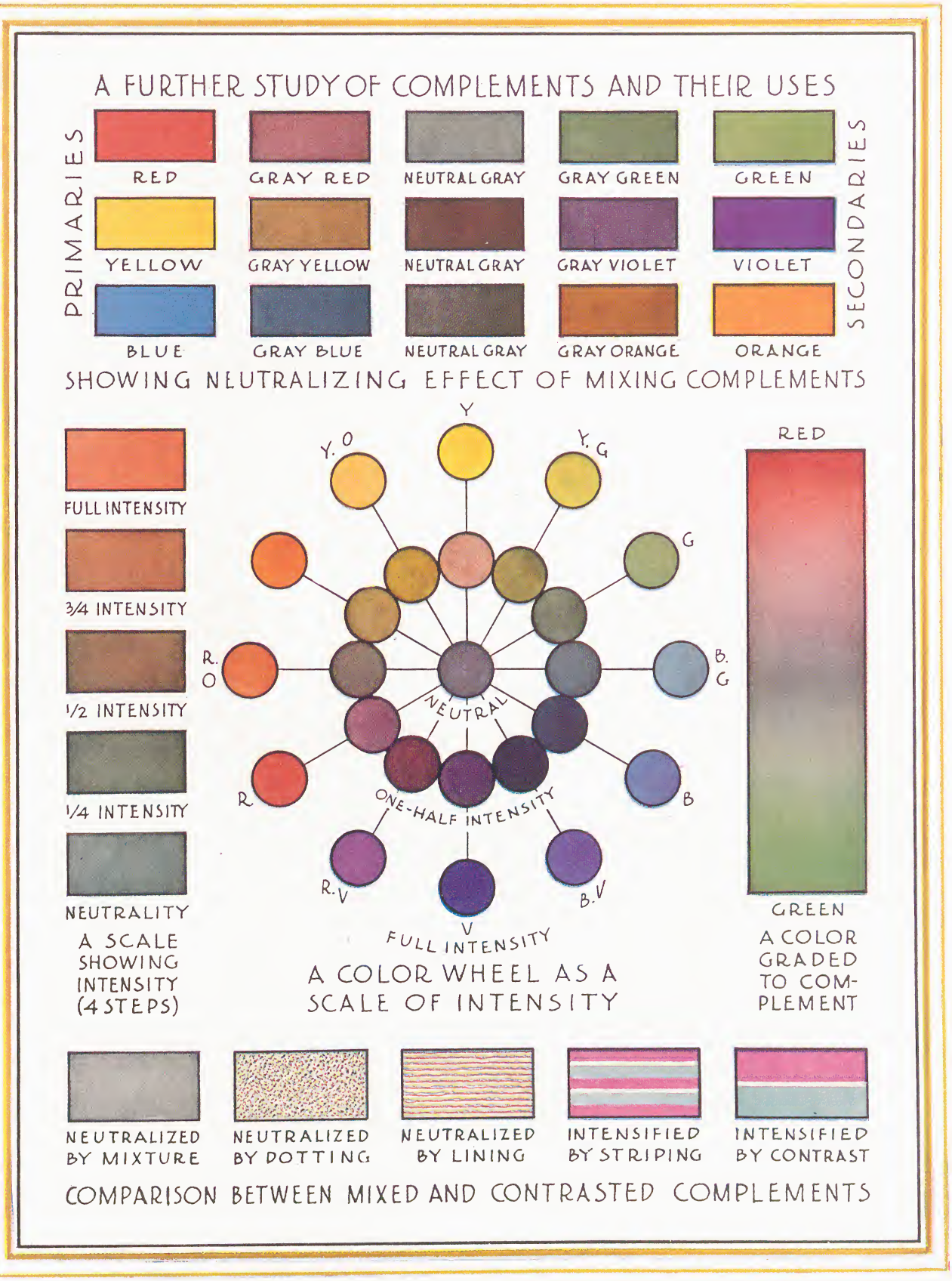
NEUTRALIZED COLORS To this point we have mainly considered colors in their full intensity, as expressed in the color wheels, Plate 9, having said little until the last few minutes about grayed or neutralized tones. Seldom in representative painting, however, can we employ our brightest colors unless in very small areas. Not only would the effect be garish, but nature has the taste to show us a majority of somewhat neutralized hues. It is mainly for this reason that we find it convenient to have our palettes include grays and browns and other dull hues, as it would take valuable time to mix them from bright ones as wanted.

Intense hues give us the best starting point in color study, however, and once we understand them we shall find that neutralized colors follow the same general laws. Let us turn to Plate 11, where are illustrated some vital facts showing the relationship between the two.

Here, at the right, is a wash grading by almost imperceptible degrees from red to its complement, green. We know that when complements are wedded in this manner they produce, no matter how intense, a variety of more or less neutralized hues. About half way from the red to the green a neutral zone will be noted in which the two opposing colors are so proportioned as to appear gray. This gray

SOME NEUTRALIZING EXPERIMENTS IN THE MIXING OF PIGMENTS

Such exercises clarify points of the utmost significance



OFFERING ADDITIONAL POINTERS ON COLOR MEASUREMENT

This sheet demonstrates that color impressions depend to no small degree upon area

corresponds to the neutral centers of the color wheels in Plates 9 and 11. Between the neutral zone and red are many gray-reds, while, similarly, there are gray-greens separating it from green. The entire wash is therefore a sort of intensity scale for measuring red and green. One learns from it that by mixing a given color with its complement in varying quantities he can produce a wide variety of intensities of both colors, along with neutral gray.

Because of the inability of the eye to measure readily such gradual changes of intensity as these, a graded wash of this sort is of less value for comparison than is a stepped scale like the one shown at the left of the same chart. In this, the red-orange of the upper rectangle is in full intensity. In the lower rectangle it has been reduced to neutrality by its complement, blue-green; this area therefore corresponds with the neutral zone centering in the red and green wash just discussed. By mixing half as much blue-green with the red-orange the tone for the middle rectangle was procured, relatively greater and lesser proportions of blue-green being responsible for the areas in quarter and three-quarter intensity.

At the top of this plate the neutralizing effect of secondaries on complementary primaries is further shown.

EXERCISE 22: A SCALE OF INTENSITY The easiest way of putting such material in permanent form is by making a color wheel on the order of that on Plate 11. Divide the outer portion in twelve parts as in the previous wheel (though here a different diagram has been adopted for its increased convenience). Fill these with colors of full intensity. Provide a second ring within, for the same colors at half intensity. Also a central neutral zone. Study, in particular, the colors at half intensity, for it is true, though strange, that most of us cannot recognize even the common colors seen in lowered intensity—gray-yellow, for instance. Not only will the preparation of this scale help you to gain acquaintance with such hues, but whenever it becomes necessary to mix them it will show their constituents. To make this wheel of still greater value, add an extra pair of rings between the others, one for three-quarter, and one for one-quarter, intensity.

JUXTAPOSITIONAL MIXTURE We shall now seemingly digress for a moment to introduce a new thought on color mixture. We all know that pigments can be mixed or blended in many ways, but there is one method which, while not uncommon, receives less attention than it should. It consists of placing in close proximity many small brush marks or spatters of two or more colors, which, when viewed from the proper distance, are merged by the eye into a single hue. This is the method used in the French impressionistic work referred to as "pointilistic." Later we shall speak at some length of the "broken" color which results from this mixture, but confine ourselves just now to certain curious facts which one discovers when he applies this method to the application of pairs of complements.

EXERCISE 23: AREA EXPERIMENTATION We have spoken of the strange paradox that while complements in mixture tend to annihilate one another, juxtaposed, each strengthens the other. This statement now needs some modification.

Mix together vivid red and complementary green pigments to obtain neutral gray, as in the lower left-hand corner of Plate 11. This proves the first of our statement true. Next, lay washes of the vivid red and green side by side, each at least an inch square, somewhat similar to the areas in the lower right-hand corner rectangle of Plate 11 (but with far more brilliant colors). Doubtless each of these last washes will appear more intense than if by itself, further substantiating our statement. But now comes the vital divergence! Give particular attention, please, for this puts us in contact with one of the most important matters of our entire volume. Cover an area about an inch and a half square with alternate stripes, each approximately an eighth-inch wide, of the bright red and green just used, somewhat as was done in the next to the last rectangle, Plate 11. You will discover as you work that with adjacent bands of this width, marked intensification of the colors will be evident, unless they are held too far from the eye. The effect may even seem dazzling, the red tending to advance and the green, especially if bluish, to retreat. (See Sargent's *The Enjoyment and Use of Color* for an explanation of this and other interesting phenomena.) A sort of oscillation is set up, making such an area more striking than the single pair of contrasting complements in the adjoining rectangle. Next comes an interesting comparison, suggested by the second and third rectangles at the bottom of our same plate. Fill a space not

less than an inch square with stippling of small dots of your red and green, and another with fine alternating pen lines of the same colors. Set them a few feet away. What has happened? Does the dotting and lining now prove that if complements are adjacently placed each reinforces the other, as we have stated? On the contrary, the red and green seem to merge to give much the effect of neutral gray—a tone peculiarly vibrant, to be sure, yet almost as gray as though the two hues were actually stirred together.

What does this prove? It proves that *area has much to do with color appearances,* a fact lacking the proper recognition. A large painting, perfectly copied or reproduced at small scale, may look disappointingly dull and gray because of this tendency of the eye to merge small areas into solid tone; for this reason more decided color schemes are usually needed for small paintings than for large, if brilliant effects are sought. As we go on we shall show, too, that one must consider not only size but arrangement of color areas: a color scheme excellent in one application might disappoint in another because of different sizes and placings of the color areas involved. It is because of these factors of area and placement that so many "systems" of color harmony, fine as they may be in theory, fail to work in general practice.

EXERCISE 24: SPATTER As further proof of the importance of area, spatter a sheet of paper a foot or so square with fair-sized drops of two or three pairs of intense complementary colors. If the spattering is sufficiently coarse, the effect, viewed from close at hand, should prove quite brilliant (some small spots may be dull, due to uncontrollable superposition), but place the paper across the room and the colors will doubtless seem to merge into a sort of oscillating or scintillating neutrality as did the stippling and lining of the previous experiment. This proves again that if brilliancy in painting is sought, one should avoid the juxtapositional use, in small areas, of even the brightest of complementary hues.

We say "complementary hues" advisedly, for related or analogous hues (those which are nearby on the color wheel) actually seem brighter and more vital when thus employed. And when colors are juxtaposed in larger areas, whether complementary or analogous, brightness is obtained, as we have seen.

We have stated that red and green, in light, are primary colors producing, in mixture, yellow. It is interesting to see that when red and green pigment are mixed by the juxtapositional method, the resultant gray usually tends slightly towards yellow. Seemingly this method of mixture more closely follows the laws of light than does direct mixture.

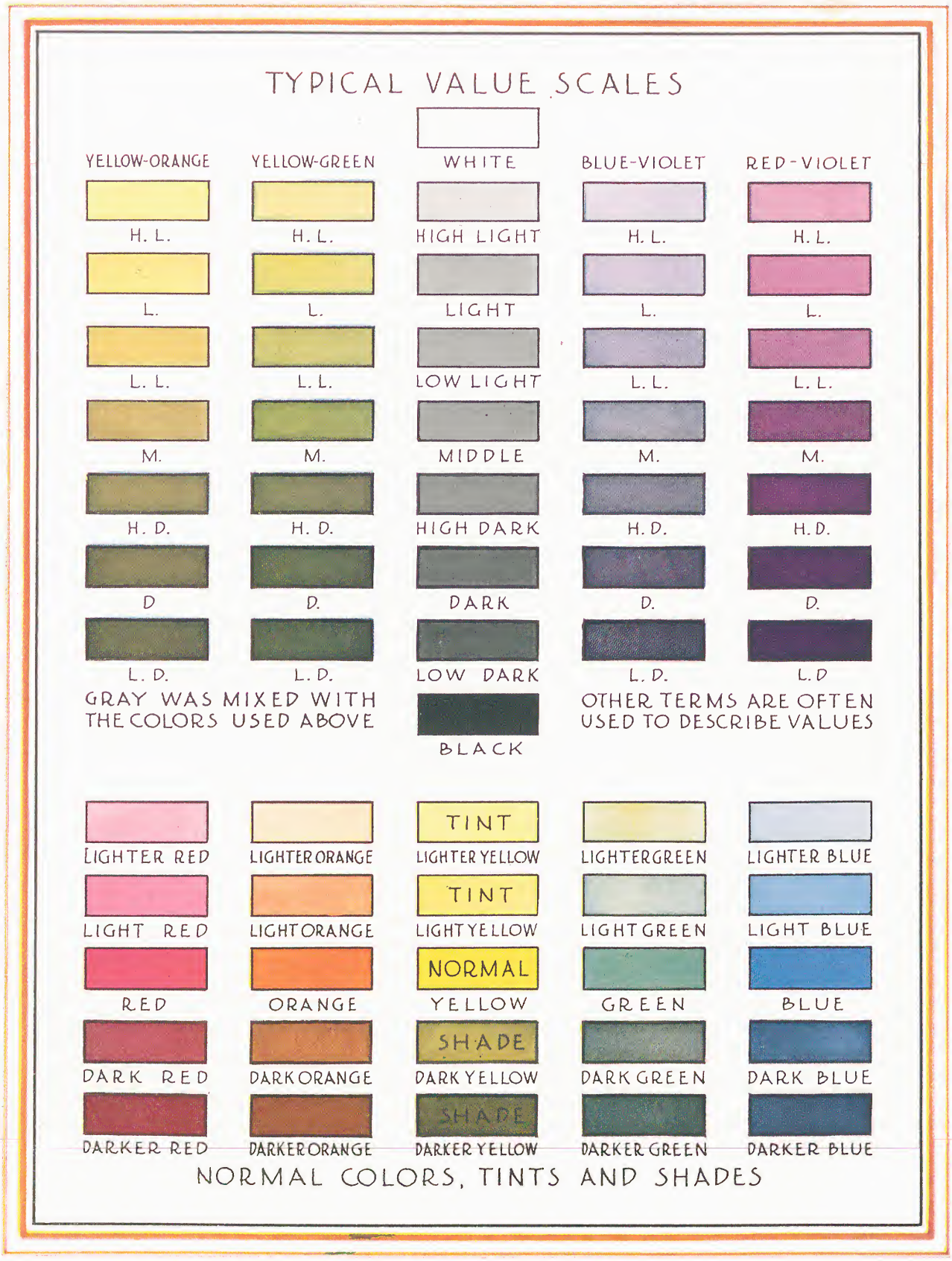
We digress to point out another frequent source of unwanted dinginess in painting, exemplified by the red to green wash, Plate 11. The artist who is unaware of the neutrality produced by grading a color into its complement, is often perplexed and disgusted to find that, though working with bright hues, his effect is becoming dull. The capable artist knows how to avoid these grays. If you wish to grade from red to green, for example, without obtaining the gray, grade from red to water (white) and from water to green, or, if this gives too light a value at the junction point, substitute a color which seems harmonious with the two—in this case perhaps yellow, which, as we saw in our study of light, is related to both.

VALUES When one has made a color wheel as a scale of hues, as suggested in Exercise 20, and a second one as a scale of intensity, as described in Exercise 22, there remains but one other such scale (or group of scales) to make, and this is for measuring values.

It will be recalled that value is that quality of color which has to do with the amount of light or dark which the color contains. By mixing black or white (water, in the case of water color pigments) with a color, we can change its value without changing its hue.

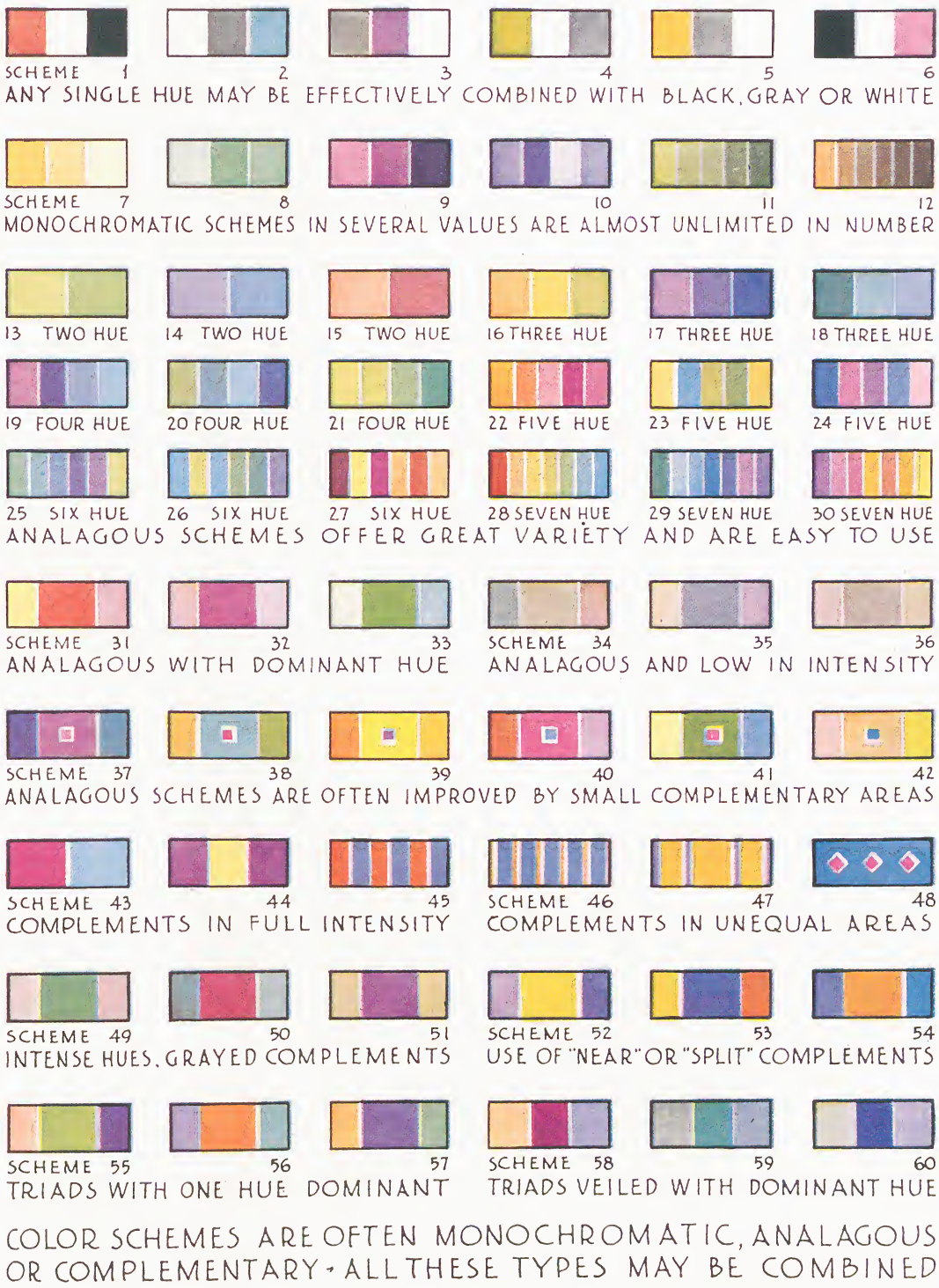
The easiest approach to value study is therefore through black and white. In black we have the lowest of all values; black stands for absence of light. In white we have the highest value which our paper and pigments permit, white representing the maximum presence of light. This gives us two predetermined extremes. By mixing black with white in varying proportions we can obtain innumerable intermediate values; for study purposes it is customary to establish a limited number of progressive steps or intervals.

EXERCISE 25: A VALUE SCALE Make an eight-stage value scale such as we present in the upper central portion of Plate 12. This, with its accompanying terms, is based on one presented by Doctor Denman W. Ross—see his volume *A Theory of Pure Design*—and seems as easy to understand as any. It is a



SHOWING SCALES FOR THE MEASUREMENT OF VALUES

The student soon learns how important values are


SUGGESTIONS FOR COLOR SCHEMES
SCHEME 1 2 3 4 5 6
ANY SINGLE HUE MAY BE EFFECTIVELY COMBINED WITH BLACK, GRAY OR WHITE
SCHEME 7 8 9 10 11 12
MONOCHROMATIC SCHEMES IN SEVERAL VALUES ARE ALMOST UNLIMITED IN NUMBER
13 TWO HUE
14 TWO HUE
15 TWO HUE
16 THREE HUE
17 THREE HUE
18 THREE HUE
19 FOUR HUE
20 FOUR HUE
21 FOUR HUE
22 FIVE HUE
23 FIVE HUE
24 FIVE HUE
25 SIX HUE
26 SIX HUE
27 SIX HUE
28 SEVEN HUE
29 SEVEN HUE
30 SEVEN HUE
ANALAGOUS SCHEMES OFFER GREAT VARIETY AND ARE EASY TO USE
SCHEME 31 32 33
ANALAGOUS WITH DOMINANT HUE
SCHEME 34 35 36
ANALAGOUS AND LOW IN INTENSITY
SCHEME 37 38 39 40 41 42
ANALAGOUS SCHEMES ARE OFTEN IMPROVED BY SMALL COMPLEMENTARY AREAS
SCHEME 43 44 45
COMPLEMENTS IN FULL INTENSITY
SCHEME 46 47 48
COMPLEMENTS IN UNEQUAL AREAS
SCHEME 49 50 51
INTENSE HUES, GRAYED COMPLEMENTS
SCHEME 52 53 54
USE OF "NEAR" OR "SPLIT" COMPLEMENTS
SCHEME 55 56 57
TRIADS WITH ONE HUE DOMINANT
SCHEME 58 59 60
TRIADS VEILED WITH DOMINANT HUE
COLOR SCHEMES ARE OFTEN MONOCHROMATIC, ANALAGOUS
OR COMPLEMENTARY · ALL THESE TYPES MAY BE COMBINED

DIAGRAMMATIC SUGGESTIONS OF TYPICAL HARMONIES

Successful schemes depend as much on area and arrangement as on selection

"neutral" scale, mainly of use for measuring whites, grays, and blacks. A color of any hue can pass through similar intervals, however, so make several additional scales similar to those in color at the top of this plate. Each hue can be mixed with gray or water to bring it to its proper value, or with its complement, which is more difficult.

MEASUREMENT If we desire to determine and name a color's value we compare it with our neutral scale or with a similar one in color. A definite classification is somewhat difficult, due to the fact that normal colors vary greatly in value. Normal yellow is extremely light, for instance, and normal violet dark. It is obvious, then, that we can produce no great number of tints of yellow or shades of violet showing marked difference in value.

EXERCISE 26: FURTHER SCALES Now make several scales more or less like those at the bottom of Plate 12. The central horizontal row shows a number of supposedly normal colors. Above and below are two rows of tints and shades, the former diluted with water and the latter darkened with gray. Unfortunately the photo-engraver made the darks in the next to the bottom row of this particular scale too dark, a fault particularly noticeable in the warm color, the shades of which should be much lighter than shown. Work for more uniform gradation from your light tints to your dark shades.

With such scales completed, try to register impressions of these tones in your mind. Do this, too, with all your color scales, for when it comes to actual painting you will need the widest possible acquaintance with hues, values, and intensities. What we have already said about variations in the values of normal hues is, however, enough to show the difficulty of accurately measuring or classifying hues according to value, particularly by eye.

Obviously all three of the color qualities considered in this chapter are so closely related that it is not easy to think of them separately. If one changes the value of a color, for example, he often changes both its intensity and hue at the same time, and vice versa. Thousands upon thousands of hues, values, and intensities are possible, to say nothing of textures, so, going back to an earlier thought, no scale or system of measurement can be of more than limited worth. We have seen, however, that some of the simple scales which we have discussed (particularly the color wheel) can easily prove of considerable profit, and we shall find other uses for them as we go along. The mere drill of making them is in itself well worth the effort, training mind, eye, and hand.

If this whole thing seems very confusing on your first reading, don't let it worry you. Make the charts as well as you can; read the text several times; turn perhaps to some of the volumes mentioned for more complete explanations, and in the meantime go right ahead with the next chapters. Gradually the entire subject will become clear if, in your later studies, you come back to it once in a while.

CHAPTER X

COLOR ILLUSIONS: VISUAL PHENOMENA

AFTER-IMAGES; SIMULTANEOUS CONTRAST; ACTIVITY

Colors do not always seem to be what they are. The artist mixes a hue in pigment form until it looks right on his trial paper, only to find that when applied to his painting the effect is different. It appears duller or brighter, lighter or darker, or even of a different hue. Perhaps it stands out too plainly, or fades disappointingly into the background. Let us investigate some of the reasons for all this.

EYE FATIGUE: AFTER-IMAGES We know that if we glance at a brilliant illuminant, such as the sun, it excites our eyes to a marked degree. Not only are they dazed, but they develop a form of fatigue which causes us to see images of the illuminant, even if we close them or look in the opposite direction. This excitation does not immediately pass away; the images endure for some time. We call them "after-images."

After-images are of different kinds, or, more properly speaking, each image passes through various stages of decay before finally disappearing. If we glance momentarily at the bright filament of a transparent incandescent light and then turn from it, or close our eyes, we can see a definite image of the filament. At first it seems bright; this is called a "positive" after-image. Gradually it changes until it looks dark, yet is still plainly visible; this is known as a "negative" after-image. By opening and closing the eyes one can often change such an image from positive to negative and back at will, as long as the retinal excitation remains sufficiently strong.

It is not so commonly recognized that after-images can be excited by comparatively mild stimuli, yet this is true. Even areas of black or white or colored pigments can cause distinct (though somewhat pale and short-lived) images; these are the kind which principally affect the work of the artist. As a rule, however, mild stimulation excites only negative images, so we shall confine our investigation to them.

EXERCISE 27: AFTER-IMAGES, BLACK AND WHITE Gaze fixedly (from a point a foot or so away) at the center of a well-lighted white disk of paper an inch or two in size, placed against a black paper background, as suggested by *A*, Figure 40. The bigger the background the better. After a half-minute, remove the disk (without shifting the eye) and you will soon see in its place its negative after-image, darker in effect than the black background. It may take this a half-second to form. For a few seconds it will gain in strength, then fade away.

When you have tried this a few times, place a black disk on a field of white, as indicated at *B*, and fix the eye upon it for a half-minute or so. Then remove the disk; a light spot of the same size and shape will soon appear, looking whiter than the white ground; it will grow more pronounced and then fade into nothing.

Experiment with white and black disks against backgrounds of neutral gray; the after-images will still be definite. Place your white and black disks side by side against gray;

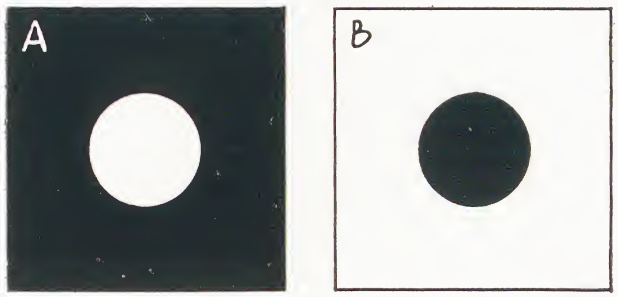


FIGURE 40

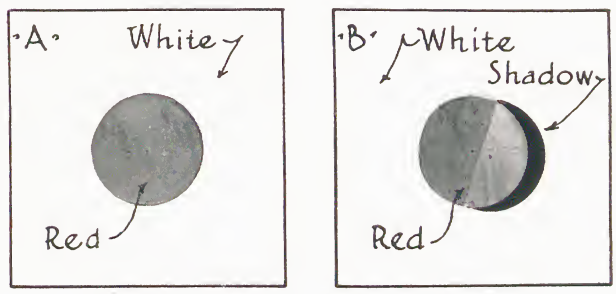


FIGURE 41

fixate them; remove them; two after-images, one dark and one light, will be seen simultaneously.

Turning to color, our prime interest, results are even more amazing. For color experiments, a packet of vivid colored papers such as is put up for school use by Milton Bradley Company, Springfield, Mass., is convenient.

EXERCISE 28: AFTER-IMAGES, COLORED Working in rather bright, clear light, place an intense red disk (any other convenient shape will do) against a large white background, as suggested at *A*, Figure 41, and fixate it for twenty or thirty seconds. Then withdraw it; you will observe, if you do not shift the gaze, that the white paper where the disk has been seems tinted with an after-image of pale green or blue-green, complementary to the red. If you prefer, instead of moving the disk you can merely shift your gaze after the period of fixation. You will find you can steer a circular spot of green at will about the paper as long as it endures.

You will perhaps note, in gazing at the red disk, a greenish fringe appearing around the edges. If you move your eyes farther from the paper you can expand this green tone to cover a much larger area. If the eye is sufficiently fatigued, a considerable portion of the white background may seem greenish if held at an increased distance from the eye. You may be conscious of this green long enough to transfer it to other objects in the room; everything on which your gaze centers will for a moment be slightly modified by this hue, whether you realize it or not.

Now turn up a portion of your red disk so a shadow is cast, as suggested at *B*, Figure 41, and fixate the disk until the after-image border just mentioned appears; as this border spreads to cover the shadow it will tinge it with green.

This phenomenon, with variations, we often see in viewing natural objects, though we are not, perhaps, aware of it. If we look at a red vase, for instance, its shadow and background may seem dyed with just a suggestion of complementary green, particularly if the eye is shifted a bit. We shall return to this thought in considering still life painting.

Now fixate the red disk once more, studying the hue of the red itself. It will soon look less vivid than at first, seemingly growing duller right before the eyes. You can demonstrate this better if you overlap the red disk with one

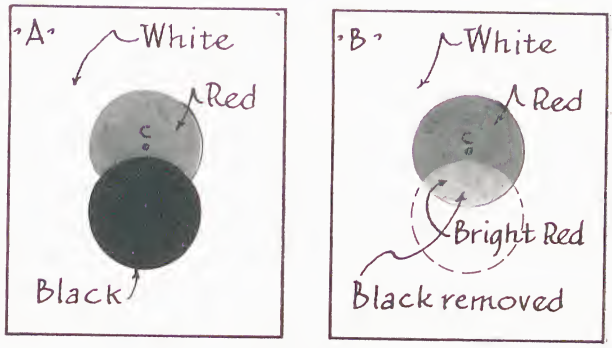


FIGURE 42

of black, as at *A*, Figure 42, gazing at the center (*c*) for a half-minute. Then, removing the black disk, you will discover, where it overlapped the red disk, a red area which for a few seconds will seem more intense than the one above. See *B*, Figure 42.

Another demonstration of interest is suggested by Figure 43. Place a strip of red paper vertically against a white background, as at *A*. Fixate the center of this, and then shift it to the horizontal position *B*. Continuing to look at the center of the red strip, an after-image band of complementary green will be seen occupying the original position of the strip, and where this image crosses the strip itself to form a square, the red will appear less vivid than on the rest of the strip. The elusive green phantom hue will seem actually mixed with the red, neutralizing it.

CAUSE OF AFTER-IMAGES The cause of these phenomena is not difficult to understand. We recall from Chapter VII that an object which appears white does so because it has the ability to reflect a considerable portion of all the light rays which it receives, so balanced as to give the effect of absence of color. When portions of the retina are momentarily fa-

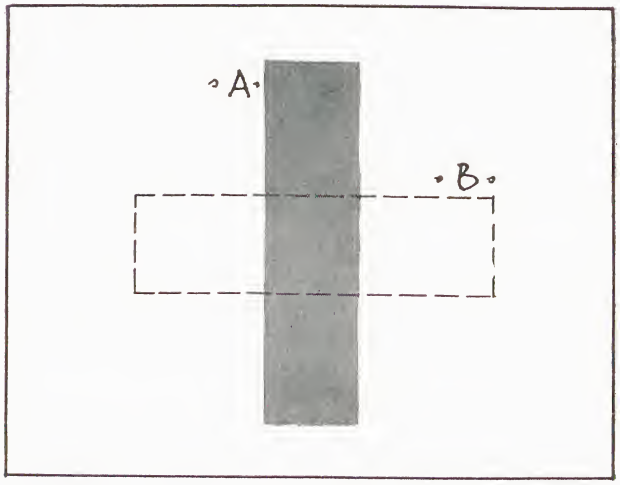


FIGURE 43

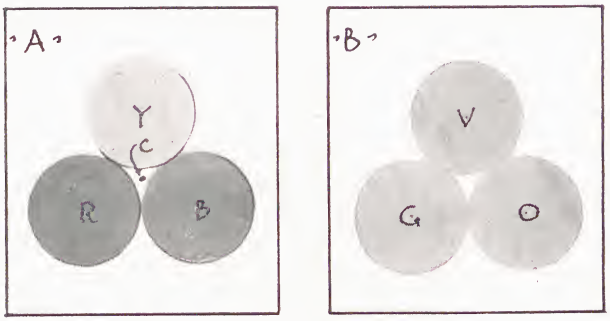


FIGURE 44

tigued through the excitation set up by a distinct color, as in these recent experiments, this balance is disturbed; the tired retinal areas are temporarily incapable of receiving the sensation of white. Being in a sense blinded to the rays of one particular color, they see only the sum total of the rays of the remaining colors of which white light is composed; these form the after-image, which obviously must be complementary to the color itself.

If we focus on a red disk, for instance, portions of the retina become fatigued by the red, and so, to a slight extent, blind to it. Sympathetically, the retina is also temporarily blind, but to a less degree, to the closely associated orange and violet. Consequently when we remove the red disk, portions of the eye are able to see only the other colors which make up white light—green, blue, and yellow—and these merge to form the greenish after-image. In a few seconds the eye recovers its sensitiveness to red and its associated colors, and the after-image disappears.

EXERCISE 29: OTHER HUES Now perform with other colors experiments such as you have carried out with red. You will discover that it is possible to create a complementary after-image for any hue. This fact is sometimes utilized in preparing color wheels, for though after-images are somewhat pale they are strong enough to make hue matching possible in tints; later each pigment tint can be brought to the needed intensity.

Experiment also with backgrounds other than white—particularly with black and neutral gray. You will learn that distinct images can be formed regardless of background.

EXERCISE 30: COMBINED IMAGES The retina can be fatigued by more than one color at a time. Arrange disks of the primaries, red, yellow, and blue, to form a triangle against a white background, as at *A*, Figure 44. Then fixate these, focusing the eye at a point (*c*) at the center. You will soon find that each color is becoming rimmed with a tint of its complementary hue. If you remove the disks without shifting the gaze, pale secondaries, green, violet, and orange, will show in disk form as after-images, as suggested at *B*.

Such compound after-images affect our vision constantly. When one views a painting, for example, he often fixes his gaze on one color after another or several colors at a time, though scarcely conscious that he does so. Then, as his gaze shifts, he transfers after-images here and there. Obviously in a painting they are seldom seen against white.

EXERCISE 31 Play with this latter thought for a moment by performing a series of tests of the sort indicated in Figure 45, where a red disk is placed to overlap yellow, blue, black, and white surfaces. After the necessary period of fixation, remove the disk and compare the various portions of the after-image. Such an experiment should be enough to prove that after-images do affect almost all color appearances.

Now for another interesting point. We have seen that if we gaze fixedly at a color, it seems to grow slightly dull as its after-image forms and blends with it. Contrarily, if we fatigue the eye with a color—orange, for instance—and then suddenly turn to look at its complement—blue—this complement will appear all the brighter for a moment. For to the blue itself the after-image blue is added. This is further proof that when the eye wanders over a painting (or from one painting to another) the appearance of its colors (unless our glance is very hasty) depends somewhat on these after-images which are being constantly produced by retinal fatigue.

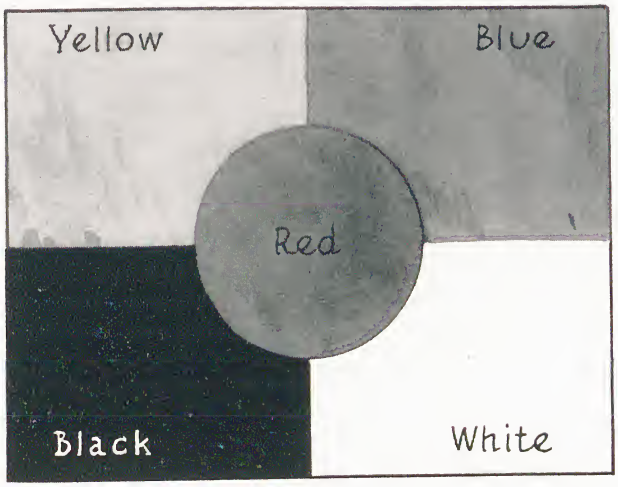


FIGURE 45

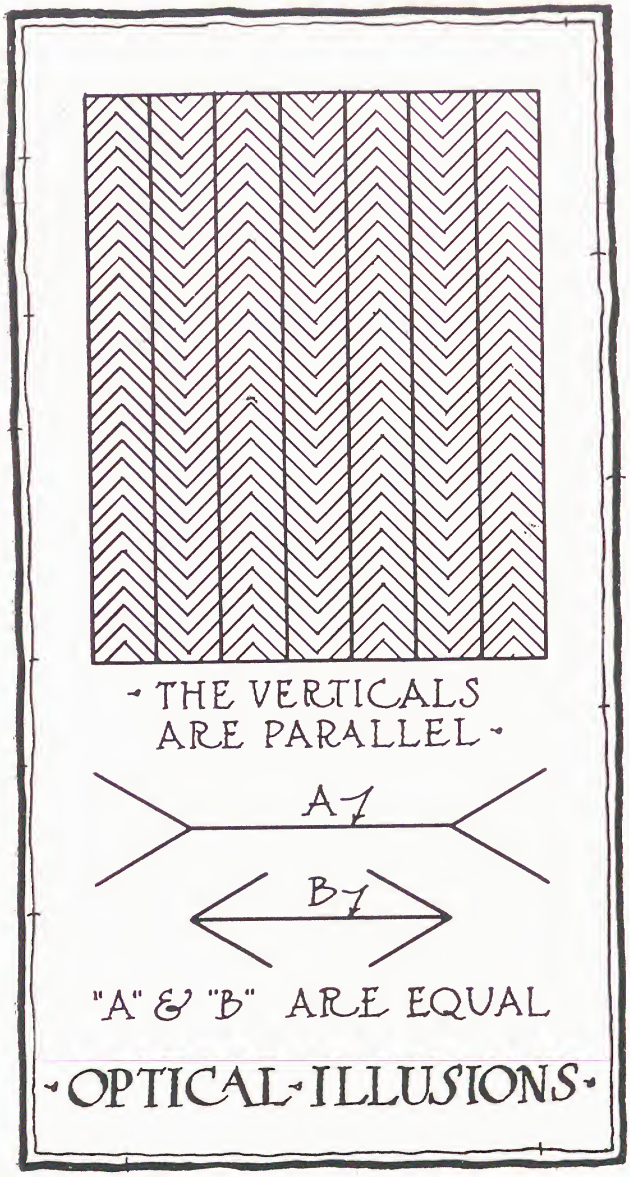


FIGURE 46

One thing which we learn from all such experiments is that complementarism is natural; that colors such as we paint opposite on the wheel, though wholly unlike, are still related, and so can be advantageously employed together under many conditions, some of which we shall take up as we go along.

OTHER PHENOMENA These remarks on retinal fatigue and its resultant after-images cover all that the student need know about this subject, for after-images, though affecting color appearances and convincing us of the relationship between colors and their complements, are such fleeting and uncontrollable things that comparatively little practical application can be made of them. Therefore, though we shall touch on them from time to time, we turn now to other phenomena of more direct application.

M. E. Chevreul, whom we have already mentioned as a famous French investigator (for many years the superintendent of the dyeing department of the Gobelin tapestry manufactories), included in his *The Principles of Harmony and Contrast of Color* the results of innumerable experiments with dyes, and the conclusions he drew from them. Though in the light of later knowledge we know that he was wrong in some of his claims, his volume has, nevertheless, formed the background for much of the discussion of color in pigment form which has followed.

Working under the handicap of the weaver (who cannot easily make changes in his work), Chevreul discovered many strange things about color. He learned, for instance, that a thread of a given color might appear faded, if used in one place, yet intense in another. He learned that colors which are harmonious in some relationships are discordant in others. He learned, in short, the general truth we stated in opening this chapter—that colors do not always seem to be what they are. Further, he worked out various rules or principles designed to assist the colorist in the practical employment of color. He particularly pointed to certain facts regarding what he called the "simultaneous contrast" of colors.

We have no room to discuss these matters at any length (one can easily turn to his own book), but we do wish to set forth a few phenomena which Chevreul and other investigators have brought to our attention, as they are capable of ready assimilation and practical application.

We are all familiar with optical illusions of line, as when parallel straight lines appear divergent or crooked, or lines which are short are made to look longer (see Figure 46). It is not so commonly realized, however, that solid areas of white, gray, or black trick us as do lines. In other words, we have illusions of tone.

IRRADIATION A simple illusion which we draw from physics is known as irradiation. If a bright object is seen against a dark background it tends to look bigger than it is. If the end of an iron bar is gradually heated, for example, it seems to increase in size (beyond its actual expansion) as its temperature is raised, until, when white hot, it appears to be considerably larger than the rest of the bar.

In drawing we can obtain something of this illusion. If we compare *A* and *B*, Figure 40, for instance, placed under bright illumination, the white circle of *A* will probably seem slightly more expansive than the black circle of *B*. The two are actually equal.

SIMULTANEOUS CONTRAST This brings us to Chevreul's fundamental law of simultaneous contrast, which tells us, in substance, that *if we arrange colors—this includes white, gray, and black—side by side or in such manner that one is seen against a larger area of another, they tend to modify one another.* In other words, *colors are modified in appearance by their proximity to other colors.* In *A*, for instance, the circle looks brighter because of the black against which it is placed, and the square darker because of the adjacent white. So great is the contrast, in fact, that the white circle actually looks whiter than the rest of the page.

FIGURE 47

While we have this point before us, let us turn to Figure 47. Here the tone surrounding the white area has been softened towards the outer edges to blend gradually into the page. This causes the eye to be drawn all the more sharply to the difference between the inner circle and its surrounding black; the white circle certainly seems whiter than white. An illusion, of course.

Another interesting illusion is shown in Figure 48, where the gray looks darker against the white than against the black, though the same throughout. In monochromatic drawings such illusions often develop, requiring readjustment. We illustrate the same point again at *A* and *B*, Figure 49, where the two gray squares are exactly alike in value, whatever the eye may say. At *C* we show a somewhat different application of the same principle, for here each of the juxtaposed tones, though actually flat, appears through induction (if rightly viewed) to be a bit graded. Each tone seems towards the edge slightly lighter or darker than it is, through simultaneous comparison with the adjacent tone.

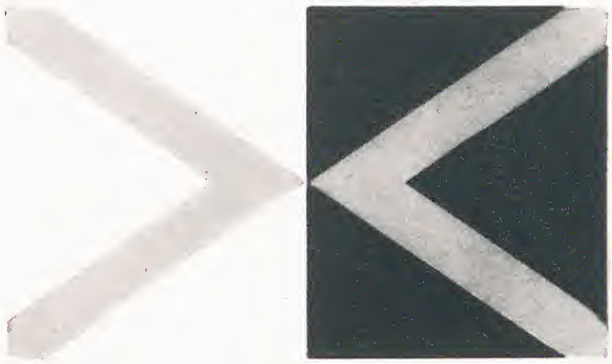


FIGURE 48

These experiments with white, gray, and black should be enough to show that each may appear different from what we know it to be. From similar experiments with colors we can prove that they likewise can deceive the eye. If we should tint the white circle at *A*, Figure 40, with color—yellow, for instance—the tint would look brighter as seen against the black than if viewed by itself on white paper. This illustrates one of Chevreul's rules that *all light colors seem most striking against black.* And, referring again to *B*, Figure 40, it is not hard to understand that *all dark colors seem most striking against white,* for this small black circle could easily be supplemented by any dark hue with little change in general effect.

EXERCISE 32 Now carry out the experiment suggested by *A* and *B*, Figure 49, but using small colored squares instead of gray ones. If you substitute green for the gray, for instance, it will appear darker on white than on black. Further, if you substitute light and dark colors for the large white and black squares, you will find that *dark colors upon light colors look darker than on dark colors,* and, conversely, *light colors upon dark colors look lighter than on light colors.* Thus, so far as values are concerned, colors appear to be quite other than what we know them to be.

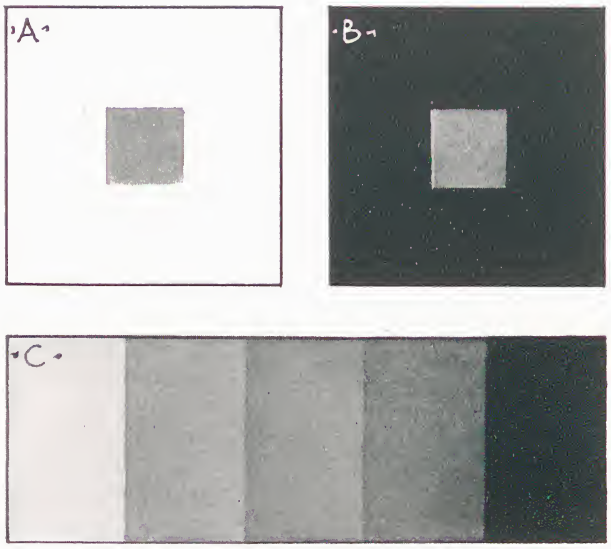


FIGURE 49

It is not only values which depend on environment, however. Place a small square of neutral gray on a blue background, and the gray will seem to take on an orange cast. The same gray against orange will show a hint of blue. This will be very evident if large squares of blue and orange are placed side by side, each centered with a small square of the same gray, and with tracing paper laid over the whole.

As a striking test, lay small green squares (or circles) in the centers of two adjacently disposed large squares, one light yellow and the other dark blue, as in Figure 50. The green against the yellow will seem darker in value than against the blue, and slightly blue-green in hue. The green against the blue will seem slightly yellowish. Not only will the two small green areas apparently differ, but the yellow, contrasted with the green and blue, may appear a bit orange, and the blue, contrasted with the yellow and green, a bit purple. Tracing paper placed over the colors will emphasize this contrast. This test demonstrates one of Chevreul's arguments, that *colors are influenced in hue by adjacent colors, each tinting its neighbor with its own complement.* Intensities, as well as values and hues, are affected by environment, as we saw in Chapter IX; *if two complementary colors lie side by side, each seems more intense than by itself.*

These are but a few of the interesting facts which experimentation with colored paper can make plain. One will learn, for instance, that dark hues on a dark ground which is not complementary will appear weaker than on one which is; that light colors on a light ground which is not complementary will seem weaker than on a complementary ground; that a bright color against a dull color of the same hue will further deaden the dull color; that when a bright color is used against a dull color the contrast will be strongest when the latter is complementary; that light colors on light grounds (not complementary) can be greatly strengthened if bounded by narrow bands of black or complementary colors; and that dark colors on dark grounds (not complementary) can be strengthened if similarly bounded by white or light colors.

These pointers serve merely as an introduction to this interesting subject. The reader who cares to investigate such phenomena further can find much of value in Chevreul's own book. Luckiesh, in his volumes *Color and Its Applications* and *The Language of Color,* offers many practical suggestions along similar lines, as does Louis Weinberg in *Color in Everyday Life* (Moffat, Yard and Company), a volume worthy of careful study.

As a final word on simultaneous contrast, its laws do not, of course, hold unless the contrasted colors are brought into close proximity.

COLOR ACTIVITY When one performs experiments like the above, he is bound to be struck by the fact that colors vary greatly in their affective and attentive value. Some can best be described as active, lively, restless, insistent, positive, bold, expanding, or advancing; others seem passive, negative, subdued, timid, submissive, reserved, contracting, or retreating. Some suggest warmth and others coolness; some impress us as heavy and inert and others as light and animated. The student should cultivate the habit of sizing up different colors which he sees about him, noting their characteristics and his reactions to them. This will help him, when it comes to painting, to choose those colors best fitted to his mood and purpose, a matter of great importance.

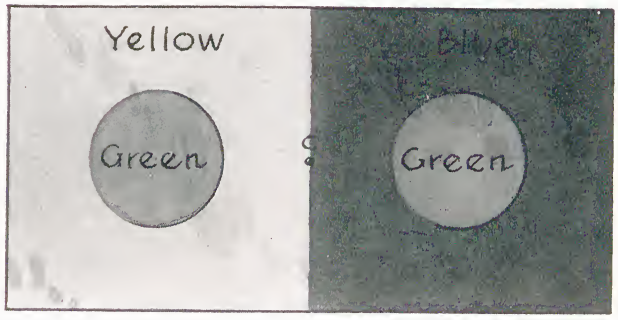


FIGURE 50

WARM AND COOL COLORS Of these various characteristics, some seem particularly significant or are sufficiently tangible to be understood easily and put to practical use. That certain colors seem warm and others cool is a thing of which advantage can often be taken. Hues of the red, orange, and yellow group are the ones considered warm; they suggest flame, blood, and sunshine, and are especially appropriate when bright, stimulating effects are sought. Hues analogous to blue are thought of as cool; they bring to mind cool water and ice and the sky of winter and are at their best (there are exceptions) for purposes requiring restraint and subordination.

Cool colors also suggest distance or expansion and are therefore often called "retreating" colors, while warm colors, contrarily, are classed as "advancing." If we wish to paint distance or make areas seem spacious we therefore give preference to cool colors; in the foreground, or where we wish attention concentrated, we use warm. As warm colors generally are associated with light, so cool colors suggest shadow, another fact that we apply when painting.

Of the various advancing colors, red and orange are considered to have the greatest force. Advertisers use them, particularly the former, as a means of gaining maximum attention. The artist employs them when he wishes particularly to emphasize a portion of his subject. Yellow has less power; it carries well and has compelling force against dark or complementary backgrounds, or if bordered or accented with dark, but is relatively weak if contrasted with light tints or white.

Retreating colors, though carrying well as dark spots, often show weakness of hue if viewed from a distance. Greens and violets stand at the half-way point between heat and cold, as they contain both warm and cool colors, and vary proportionally in their abilities to advance or recede. Yellow-greens, and violets leaning strongly towards red, tend to advance and have considerable power to attract; blue-greens and blue-violets tend to recede, and have little compelling force.

The carrying or attractive power of colors depends, as our experiments have indicated, not alone on hue, but also on value and intensity. A gray-red, for example, though it may attract as a dark spot, will have little force compared with the same hue unneutralized. This will be plainly evident if paper slips of these colors are placed across the room. We have already seen that the activity of colors depends to no small extent on background. Distance, too, plays an important part in color strength. If one looks down a long city street with brick buildings on either hand he will generally observe that the reds of the brickwork appear more and more dull or indistinct as they go into the distance, particularly if the atmosphere is a bit hazy, a blue or purplish hue gradually taking the place of the red as extreme distance is approached. In other words, warm tones usually appear cooler in proportion to their distance from the eye. This is true of all colors to some extent. Cool colors do not always seem to retreat, by the way, certain vivid hues, viewed nearby, appearing particularly vigorous and emphatic, especially if against a complementary background. The author recently noticed, near at hand, a bright blue automobile, which, contrasted with brown and red buildings, seemed extremely conspicuous. As it drove away its color softened rapidly.

Not only do colors show such activity as we have mentioned, but they have the power of stimulating a wide variety of emotional reactions. Such matters have been so ably treated in Sargent's *The Enjoyment and Use of Color,* Weinberg's *Color in Everyday Life,* and Luckiesh's *The Language of Color* that we shall make no attempt to discuss them. This latter volume would be an excellent one for the student to read at this time; it touches on color in mythology, nature, literature, painting, religion, and the theatre. There are illuminating chapters on symbolism, explaining the significance of individual hues. There are also chapters on nomenclature, psychophysiology of color, color preference, the affective and attentive value of colors, etc. Finally come helpful statements on aesthetics, harmony, and the like. Sargent's and Weinberg's books, for that matter, go into many of these same things.

What we have offered here is enough to show what a complex thing color is, emphasizing the need for serious study and experimentation on the part of the earnest student. Yet one can paint successfully (and many artists do) with little knowledge of the reasons behind such things as we have been discussing. Don't feel, in other words, that you must devote days and days to their study before trying your hand at actual representative painting.

CHAPTER XI

SOME POINTERS ON COLOR HARMONY

WITH DEFINITE SUGGESTIONS FOR COLOR SCHEMES

Experience has taught us that certain combinations of colors, whether in nature or art, affect the eye and mind agreeably, while others give offense. We call the former "harmonies" and the latter "discords."

Just as numerous attempts have been made to discover the laws of light and of color vision, and to invent practical systems of color measurement and notation, great effort has been expended in trying to ferret out the reasons why some combinations of color are pleasing and others are not, and to devise laws to insure harmonious color employment. We have finally learned, however, that even if it were possible to grasp all such reasons, workable laws guaranteeing immunity against chromatic discord still could not be devised.

In view of the contrary claims of some writers, we offer the following arguments to substantiate our statement.

First, as demonstrated in the last chapter, colors change in effect according to their environment, each hue being modified by those adjacent to it. Color harmony is not merely a matter of selection, therefore, but also of arrangement—a fact not nearly as commonly recognized as it should be. A color scheme extremely pleasing to the average person can become, in rearrangement, positively disturbing. Arrangement, in representative paintings, obviously cannot be controlled wholly by rule.

Area, like arrangement, influences color appearances, as we saw in Chapter IX. A harmonious scheme can often be made discordant (or at least uninteresting) and vice versa, simply by increasing or decreasing certain color areas. It is easy to see that a small spot of vivid red, which delightfully reinforces, through contrast, a large area of bright green, might, if sufficiently expanded, rival the green, causing a disturbing division of interest. Area, like arrangement, cannot be arbitrarily regulated.

Nor can such phenomena as the oscillation described on page 52 be controlled by law, yet this relatively small thing is capable of making some schemes disagreeable and others pleasing or telling.

Texture, though not a quality of color, is another influence that can seldom be ignored. In architecture and decoration, for example, things harmonious in color often show textural inconsistency or discord. A mere coating of varnish, changing dull woodwork to shiny, can be enough to upset a scheme completely. Even in painting pictures, texture harmony is almost as important as color harmony—the two are closely wedded—yet it follows no definite laws.

Color fitness or suitability must also be considered, as must that ever-pressing matter of personal taste. After all, who is to say which colors do and which do not harmonize?

This should be enough to warn the student against the exaggerated statements of writers who claim or imply that their methods or systems of obtaining color harmony are infallible or universally applicable. Printed laws, or a clever scale or wheel or some like device designed to reveal color schemes, can be of only limited help.

Luckiesh ably sums up this whole thing when he says, referring to laws of harmony, "These . . . . . are meant to be mere guideposts and are not to be taken as distinct boundaries of the different classes of color harmonies. In fact, a given harmonious arrangement may not be in accordance with any single principle, but is likely to involve more than one. No simple laws of color harmony can be framed which will be separated by distinct boundary lines. Furthermore, when other factors are considered such as the indefiniteness of the nomenclature of color, the indeterminateness of individual taste, and the meagerness of data, it must be concluded that these laws of color harmony can be viewed at present only as general statements. They will not become more specific until the accumula-

ITALIAN GARDEN FANTASY, PASTEL DRAWING BY HARRY V. K. HENDERSON

Here the scheme is fundamentally monochromatic, with hints of analogy. Original, 11" x 14"

tion of knowledge has made this simplification possible and doubtless will never be expressible with exactitude. It is not intended that the foregoing statements should discourage the use of these general laws, or the establishment of others as the knowledge of color harmony accumulates, but they should serve to caution those who take these laws too seriously at present."

GENERAL LAWS From Chevreul on, so many writers have discussed these laws that we shall not attempt to go into them thoroughly here. The books mentioned in the last chapter have quite a bit to say in this direction. As previously pointed out, the reader interested mainly in the representation of actual places and things can base his harmonies largely on nature, his problem being less difficult than that of the designer or other person using color in more individual ways.

So the thing we shall stress is a comparison of some actual color schemes. These will at least start the student on his way, so that if he does a bit of reading now and then, and studies nature and fine things in color, including paintings, and constantly practices with his pigments, he will gradually develop the aesthetic instinct which the artist needs.

ONE COLOR WITH WHITE, GRAY, OR BLACK The simplest scheme we find (if of sufficient importance to dignify with the name) is that of an individual hue, used in one value and intensity in conjunction with white, gray, or black (taken individually or collectively) and, sometimes, with silver or gold. A common illustration of this scheme is the booklet printed with black ink on white paper (the type masses giving the impression of gray), but with a cover of colored stock, or with initials or decorations of one tone of a single hue.

Schemes of this type seldom give offense, for there is nothing about any single color, pleasing in itself, which should prove objectionable when used in conjunction with colorless white, gray, or black. Some schemes are more effective than others, however. As a rule, if a single color is to be used with large areas of black, a warm one—red, orange, or rich yellow—seems most effective; these colors have a brilliancy and vigor which appear to relate them to black. If such cool colors as blue, blue-green or blue-violet are employed with black, they are at their best if quite intense. A pale violet on black is seldom inspiring; but bright emerald green can be delightful.

White often impresses us as somewhat warm. If a single color is to be used against it, a rather dark, cool one perhaps gives the happiest contrast; blue and white has always been a popular combination. For softer effects, the light, warm colors are suitable, though any colors, especially if employed as tints, are usually pleasing against white.

Plate 13 illustrates some of these fundamental ideas in a conventional manner in Schemes 1 to 6, inclusive. These have no particular significance, however, beyond reminding the student of this elementary type of harmony.

THE MONOCHROMATIC SCHEME The painter makes little use of the type of scheme just discussed, so we shall turn to the simplest one which he commonly employs. Like the other, this scarcely deserves a title, though it is generally known as monochromatic (one color). We have in mind a single hue used in any desired number of values and intensities. This sometimes means dilution with water (in water color work), the admixture of black, or both.

This scheme is merely an extension of the previous one to include all values and intensities of a hue, used with or without white, gray, or black. The most frequent illustration, perhaps, is the drawing done on white paper with a single color—sepia, for instance—the values ordinarily varying from light tints to dark shades. Schemes 7 to 12, inclusive, stand as reminders of this particular use of color. Each of these shows variations of a single hue; such variations are sometimes called "self-tones." There are those who insist that in the use of self-tones there can be no color harmony, for there is nothing with which the color could possibly agree or disagree. Strictly speaking, this is true, and such schemes undeniably run the danger of becoming monotonous. On the contrary, it is surprising how colorful some such arrangements are; there is surely no dead uniformity to those suggested on Plate 21, page 80, where single colors have been mingled with black on white paper. A sketch done in white or black or both on brown paper would also fall within this general category; such a sketch sometimes seems surprisingly rich in hue. In a scheme of self-tones there is usually ample interest if the values are sufficiently contrasted.

If the artist wishes to get slightly more

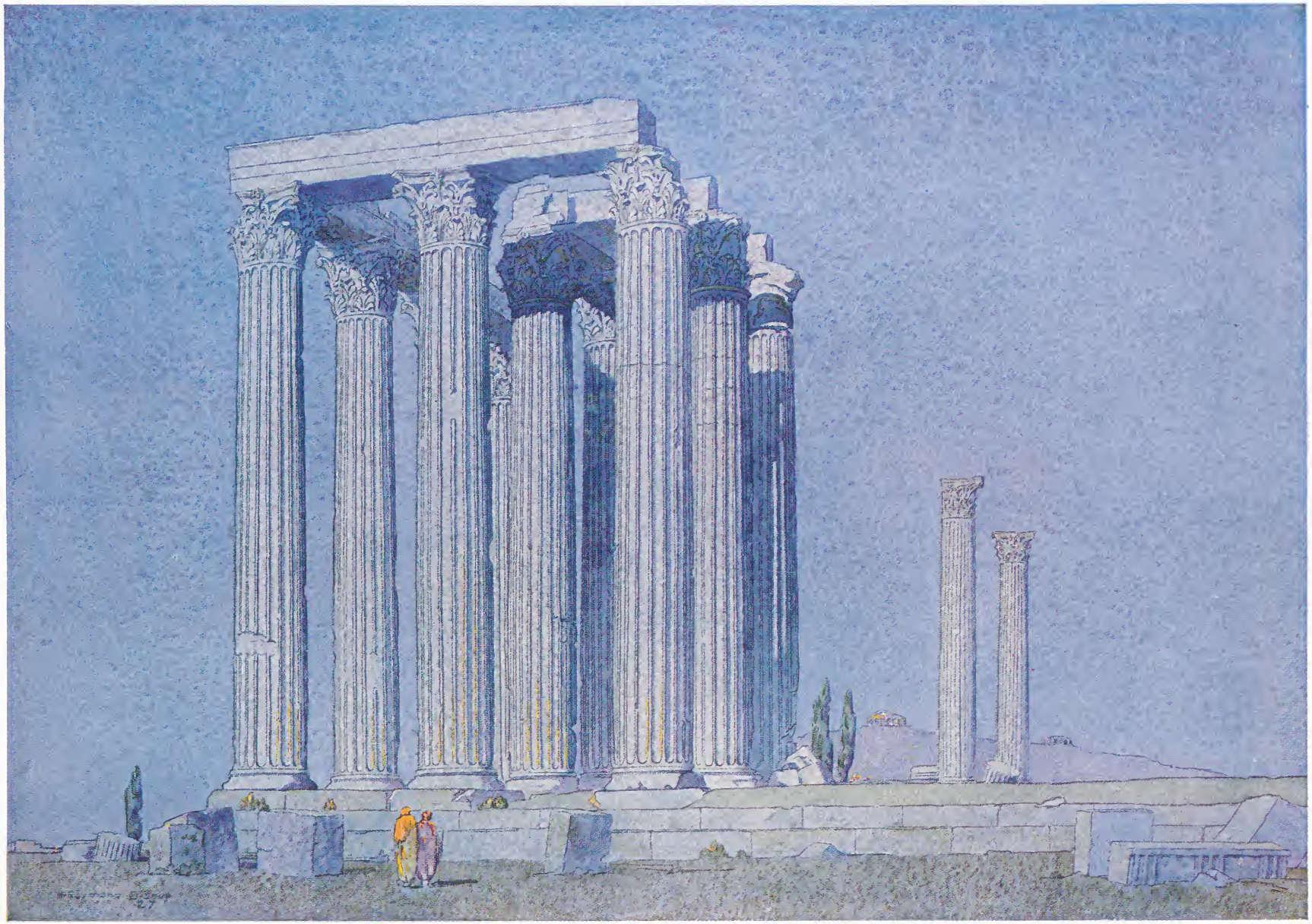
variety than the strictly monochromatic scheme affords, it is a simple thing for him to add inconspicuous suggestions of other colors. This has been done delightfully in the beautiful pastel drawing by Harry V. K. Henderson, reproduced as Plate 14. Though blue is the predominant color, there is a hint of the related hues, green and violet; also the slightest indication of a warm tone of more or less complementary nature. These subtle touches, barely distinguishable, are enough to give the impression of a satisfying opulence of hue, yet the drawing remains fundamentally monochromatic.

Somewhat similar in scheme, though lighter in key, is the splendid water color study by H. Raymond Bishop, Plate 15. Though this strikes one primarily as monochromatic, relieved by small accents of complementary orange, it reveals, on close inspection, pale traces of several hues both analogous and complementary. H. Van Buren Magonigle's masterly architectural rendering, page 320, again shows much this same use of colors, blue, once more dominant, being subtly supported by suggestions of analogous violet, green, etc., and intensified by means of the yellow and orange complementary accents conspicuous in the flagpoles and lights—particularly in the globular beacon. Still another strikingly beautiful illustration of much the same scheme, though presenting a slightly different type of modification, is the rendering in oil by James Perry Wilson, Plate 100, page 213. As before, the first impression is of blue, which can be called the dominant color. There is a greenish tinge to much of it, however, and traces of violet here and there, so we once more have the dominant color supported by faint analogous (for the most part) hues, and accentuated by the rather prominent complementary touches of the lighted windows, with their reflections. Conspicuous as these accents are, they are cleverly brought into unity with the whole by means of the introduction of warm hues into the somewhat cool tone of the architecture, the blue-green resultant giving us, behind its coolness, a sense of warmth. When a complementary tone seems thus merged with the dominant, it is sometimes said to "veil" it. Though we could describe this drawing as monochromatic in effect, with complementary accents, a more complete description would point to its close analogy of cool colors—blue, supported by green and faint suggestions of violet—partially veiled with complementary tones and contrasted with complementary accents.

As it chances that all these recent examples have blue as the dominant note, we therefore point, by way of variety, to the simple but highly effective rendering by Louis A. Coffin, Jr., offered as Plate 16. Here the color scheme is mainly monochromatic (green) with accents of the complement (red) on the chimney and, faintly, elsewhere. It is interesting to observe that here the green paper forms the keynote for the entire scheme. We have already hinted at brown as another color often employed monochromatically; the sepia, bistre, and sanguine of the old masters fall into this general class.

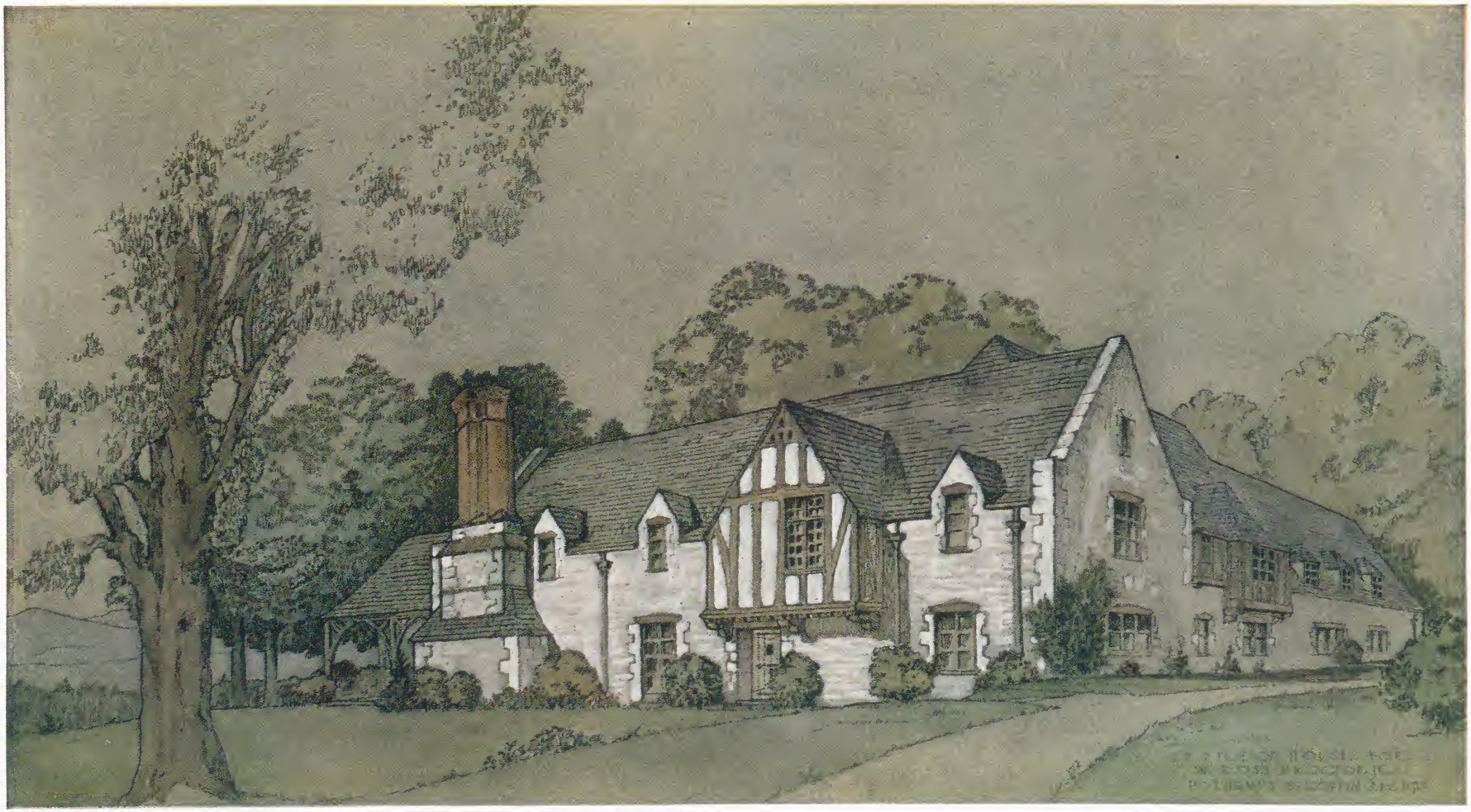
ANALOGOUS SCHEMES Relatively speaking, schemes classed as monochromatic are rare in the work of the painter, so let us turn to what is perhaps the most simple type actually worthy of the name, the "analogous" or "related" scheme. Such a scheme, as its name implies, is made up of colors which are nearby in the spectrum. Orange, yellow, and green, for example, form an analogous scheme, as they all contain the common factor yellow.

A glance at a color wheel, as in Figure 4, Plate 9, will show the student what groups of colors are analogous. If we start with yellow, we note that yellow-orange and yellow-green, which are made up largely of yellow, are particularly close in relationship. These three form a "close" analogy; if to these we add orange and green, each of which contains some yellow, this entire five-hue group is analogous. Strictly speaking, we can even include red-orange and blue-green (though here we approach danger) because each of these has a slight yellow content. This gives us, centering about yellow, seven hues out of the twelve of our scale, or more than half the wheel, somewhat related. In arranging analogous schemes, however, the more of the circle we include the greater our difficulties, so typical analogous schemes usually take in not more than a third or a quarter of it. Schemes 13 to 30, inclusive, Plate 13, show numerous suggestions. Such schemes, when based on two, three, four, and sometimes even five hues (in relation to a twelve-hue wheel) are perhaps the safest and surest of all the schemes available to the artist. In other words, there is no easier way for one to get harmonious color than to limit himself to a few hues showing a clear indication of



TEMPLE OF JUPITER OLYMPUS AT ATHENS, PAINTING IN WATER COLOR BY H. RAYMOND BISHOP

Though this scheme is mainly monochromatic, with complementary accents, it offers traces of other hues. Original, 20" x 14"



RESIDENCE BY POLHEMUS AND COFFIN, ARCHITECTS; WATER COLOR RENDERING ON TINTED PAPER BY LOUIS A. COFFIN, JR.

Again the scheme is basically monochromatic, with touches of the complement. Original, 18" x 10"

mutual relationship. As one increases his number of analogous hues to six or seven, as in Schemes 25 to 30, thus taking in half or more than half of his wheel, he loses the true effect of analogy. In Scheme 28, for example, the hues, strictly speaking, are analogous in the sense that they are slightly related because of a common bond of yellow, this being present, though in small proportion, even in the red-orange and blue-green shown at the extremities. We know, however, that blue-green and red-orange are actually opposite on the chromatic circle, or complementary. Therefore, though Scheme 28 is pleasing enough, we have stretched a point in calling it analogous when two of its colors are true complements. This is why we urgently advise the student never to use at one time, as analogous, more than those colors occupying approximately one-third of the wheel. It is, of course, possible to have analogous schemes of six or seven or even of innumerable variations of hue provided they show such slight differences that they could all be included within approximately a third of the circle.

Even if one does limit himself to about this arc, chromatic success, though likely to follow, still cannot be guaranteed. The author recently noticed a florist's delivery truck of a pale violet hue standing before a brick wall which in the sunshine was a vivid red-orange. Both these colors had quite a bit of red for a common factor, but it was not enough to relate them pleasingly; the delicate violet could scarcely have seemed more out of keeping anywhere than it did against the vigor of the red brickwork. But this is the exception.

Now, as an excellent example of harmony based largely on analogy, turn to the clever gouache drawing by Adolph Triedler, reproduced as Plate 76. Here we have, for the most part, a blue-violet, blue and green analogy—one mainly emphasizing the cool colors. The touches of complementary warmth in the artist's signature and on the awning, the timbering and parts of the foliage, are not enough to destroy the fundamentally analogous character.

Quite different in effect is the lively pastel rendering by Francis Keally selected as Plate 17, for here the scheme, while again mainly analogous, emphasizes the warm side of the circle. Red-orange dominates the whole, with orange and violet in support. This violet, where it leans towards blue, introduces a suggestion of complementary contrast, yet this is not sufficiently strong to keep us from classifying the drawing as analogous. It is interesting to note that the beautifully indicated distance makes use of no new hues, but merely softer tones of the old.

ANALOGOUS SCHEMES, WITH DOMINANT Before leaving the matter of analogous schemes we should make clear that though they are often among the most pleasing which we have, and as easy as any to handle, the very unification which makes them harmonious may at the same time make them monotonous. The artist must seek to develop in them sufficient hue interest (as well as variety of value, intensity, and arrangement) to prevent monotony.

One of the easiest means of obtaining interest is by placing emphasis on a dominant hue. We have seen how this was done in Mr. Keally's drawing: the same thought is illustrated in diagrammatic form in Schemes 31 to 33, Plate 13. There are various ways of making a particular hue dominate; it often does so because of its large area, dark value (against a lighter background), light value (against a darker background), or intensity. Analogous schemes light in value and low in intensity are common (see Schemes 34 to 36, inclusive) in which domination of some one hue is usually brought about through increased area. Interior decorators frequently use such schemes for their backgrounds, and architects in their selection of building materials.

ANALOGOUS SCHEMES WITH COMPLEMENTARY ACCENTS The artist, when he feels too strongly the monotony of analogous schemes, often enlivens them by the introduction of complementary accents. We express this in a simple manner in Schemes 37 to 42. Such accents, particularly if brilliant, generally have a power out of all proportion to their size. A single touch of color complementary to one hue—usually the dominant—of an analogous scheme can give surprising life to the whole. We earlier pointed out that Corot, in his incomparable landscapes, often added a touch of red or reddish—perhaps a cow or a man's cap or jacket—to bring vitality to his somewhat sombre greens.

COMPLEMENTARY SCHEMES It is but a step from this use of complementary accents to complementary schemes, sometimes known as "harmonies of contrast." Under this heading we can include any pleasing schemes which

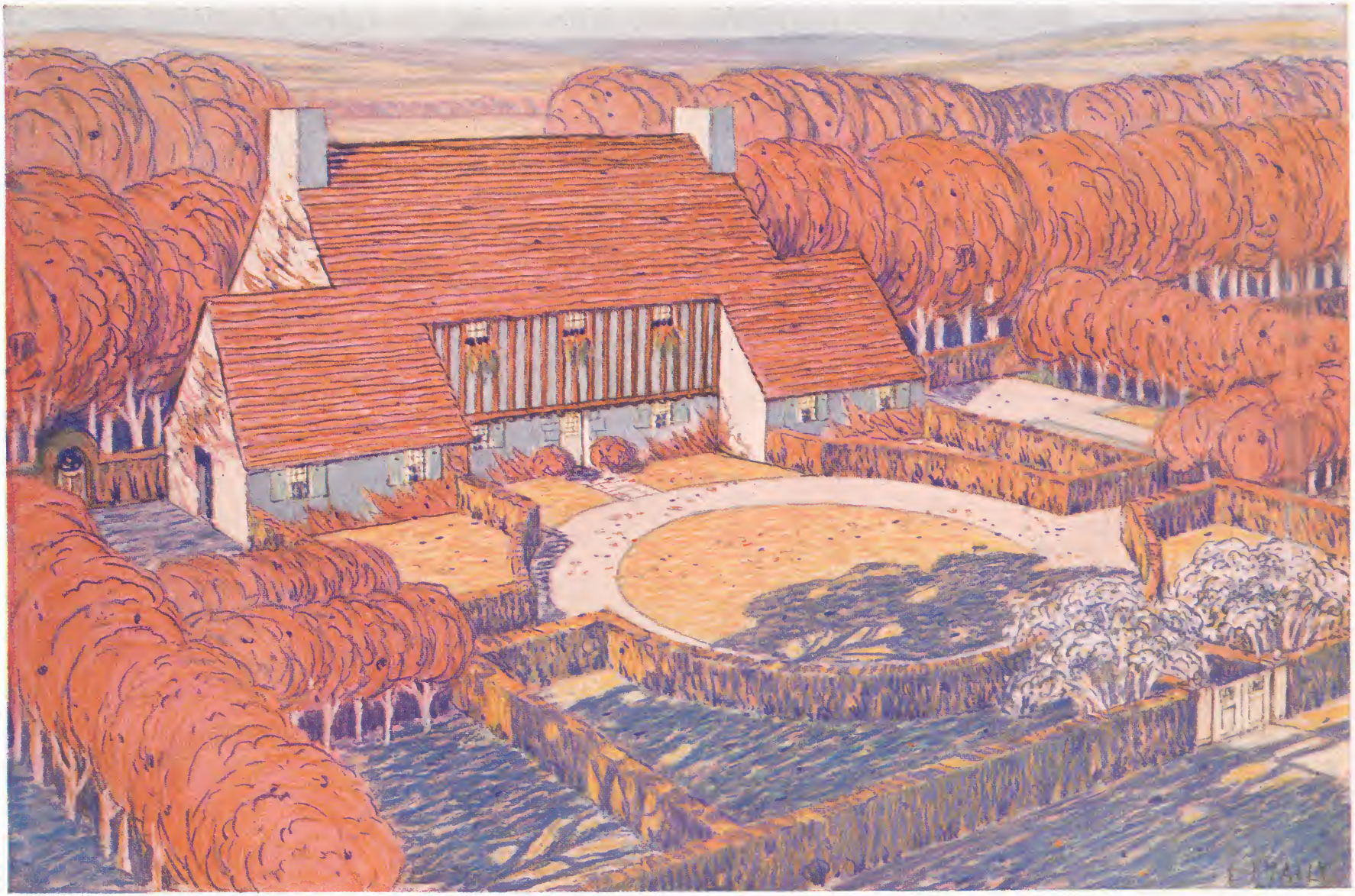
conspicuously introduce opposite colors. In fact the majority of all color schemes are to an extent contrasting, the contrast usually being developed by means of complements.

Our experience with after-images and simultaneous contrast made clear that a very definite relationship exists between such colors as we call complements, even though they usually lack the unifying influence of any common hue. Green and red, for instance, are as unlike as any two colors could possibly be, yet we have seen that even they are related. It is doubtless because of this subtle relationship that we like to bring into opposition colors which on casual inspection seem wholly dissimilar. Perhaps this is to an extent due to some physiological or psychological need for balanced retinal stimulation. Whatever the reason, it is certainly true that a majority of people prefer harmonies of contrast to those of analogy. (The familiar phrase "harmony of contrast" would seem inconsistent, by the way, if we did not know that opposites have this strange affinity.) Some go so far as to say that color schemes never seem to them complete and satisfying unless they contain *all* the leading colors in balanced pairs. Whatever one thinks about this, nature, as we mentioned in an earlier chapter, is profuse in complementary schemes, and we enjoy her variety. We must control our contrasts, however, or we get, instead of harmony, chaos. We would seldom think of the combination of equal areas of fully intense complementary red and green as pleasing, for instance. Schemes 43 to 45, Plate 13, were intended to illustrate this thought, though we note too late that the engraver failed to give expression to what was intended. Scheme 43, for example, was supposed to show a brilliant contrast between red and green, and Scheme 44 a similar one between yellow and violet. Our purpose can be summed up in the general law that one should *never base a color scheme on complementary colors in equal areas and full strength.* The most perfect exterior or interior in the world would be ruined if alternately striped with equal bands of brilliant red and green. Such a contrast has strong attentive interest but that is its only virtue. A suit made of equal stripes of orange and blue, as used in Scheme 45, would compel attention, but we could scarcely call it beautiful.

If we examine this rule, however, we find the key to successful complementary arrangements. Note it advises us not to use complements "in equal areas and full strength." Here lies the key, for we can employ complements to advantage in unequal areas or in varying strength. A large red area and a small green area, for instance, often seem harmonious, for the dominant red gives unity to the combination. Likewise a brilliant red can be employed successfully with a neutralized green, even though the areas are equal, for the red will dominate because of its superior intensity. In Schemes 46 to 48 we illustrate this point in a simple way, though in 48 the engraver unfortunately substituted blue for the intended bright green. Schemes 49 to 51 show fairly intense hues successfully combined with grayed complements, mainly in light values.

A particularly useful complementary scheme, especially when it comes to the representation of landscape, or architecture in a landscape setting, is admirably exemplified by Charles C. May's delightful rendering, Plate 18. Here closely related tones of orange (and near-orange) are contrasted with similarly related blues. In simple analysis, therefore, this is a complementary scheme based on the orange-blue pair of opposites. The orange represents all the warm tones in the subject and the blue all the cool. These are kept from clashing by the expedient of working some of the warm tones into the cool, and vice versa. The sky, for instance, is neither blue nor orange, but suggests both. As a further harmonizing influence, neither the orange nor the blue is used in full intensity. And both are modified by other hues, the warm areas revealing traces of yellow and considerable reddish brown, and the cool areas indications of blue, green, and violet. In other words this scheme is, in exact analysis, based on two delicately balanced analogous groups, one with orange and one with blue dominant, the cool group being less assertive than the warm.

One main advantage of this scheme is its relative simplicity; it shows us what a rich effect can be obtained with only a limited palette. Some artists feel that such a warm and cool combination affords the student the best approach to his color problems, especially as they relate to outdoor sketching. E. Barnard Lintott, for instance, in his helpful volume *The Art of Water Colour Painting* (London, Chapman and Hall, Ltd.), has this to say: "For a young student there cannot be a better way of entering upon the study of water



PROPOSED DESIGN FOR A HOUSE ON LEVEL GROUND—PASTEL RENDERING ON SANDPAPER BY FRANCIS KEALLY, ARCHITECT

Here we have a scheme largely analogous, with a warm hue dominant. Original, 26″ x 17″

RESIDENCE OF JOSEPH H. GAY, ESQ., MAY AND HILLARD, ARCHITECTS; RENDERING IN WATER COLOR BY CHARLES C. MAY

In this complementary scheme blue represents all cool colors and dull orange all that are warm. Original, 35½" x 19¼"

colour than by rigorously banishing all but two colours from his palette. It is the best and surest way to the study of full colour. The colours should be a cold and a warm one; cobalt blue and warm sienna—or Prussian blue and burnt sienna—are two combinations which lend themselves to a great variety of treatment.

"The opposition of the qualities of warm and cold colour are then only to be looked for, and a valuable lesson can be learned in this way as to the preservation and balance of all important masses of colour. The greatest water colourist the world has ever known began in this way, J. M. W. Turner, and it was by the absolute mastery of these simple means that he finally entered into that opulence of full colour that few but himself have ever achieved."

Our drawing by Mr. May shows how adequate an expression can be given to a subject by colors similar to those recommended by Lintott. The reader is heartily urged to try some such limited palette as a test of the value of this recommendation. If there is danger from thus employing colors which are complementary, it is that too much dullness may creep in where they merge, particularly if they are absolute complements.

NEAR AND SPLIT COMPLEMENTS The eye does not demand, however, that in contrasts of a complementary nature, absolute complements be used. This would be difficult, as we know, even if desirable. But fortunately (as already hinted) complements which are only approximate or "near" seem more pleasing, many times, than those which are true. The term "near complements" is self-explanatory; violet is the true complement of yellow, while blue-violet and red-violet are near complements. If we speak of these near complements in their relation one to the other we call them "split" complements, as they are split or separated by the true complement.

Our color wheel, Figure 5, Plate 9, page 47, shows a helpful device in the form of a pivoted pointer so designed that if *A* be directed towards a given hue, *B* and *C* indicate the near or split complements. Schemes 52 to 54, Plate 13, picture, diagrammatically, combinations made up of such complements.

TRIADS If we base a color scheme on a color and its split complements, or on hues mixed from them, we can obtain a fairly wide range of hues, but none of them will be brighter than the color itself and the two split complements in their full intensity. Sometimes such a range proves too limited, so in place of these split complements which are closely related to the complement itself we use other split complements, each a step further removed. In the twelve-color wheel at 4, Plate 9, for example, if yellow should be taken as a hue to dominate a color scheme, and the split complements red-violet and blue-violet (alone or in mixture) should prove too dull to hold their own, red and blue might be substituted. In this case we would be using three colors equally spaced on the wheel; this we call a "triad." We show in Figure 4, Plate 9, a device which locates triads. When *A* points at a given hue, *B* and *C* reveal the other two component colors.

Though mixtures obtained from triads can be very rich and beautiful, triads by no means guarantee color harmony. The red, yellow, blue triad is made up of our three primaries; we know that practically *all* colors can be mixed from it, discords as well as harmonies. To get effective results, therefore, one hue of the three is usually selected to dominate the scheme and the other two are mixed together or with the first, or are greatly diluted, or otherwise rendered less potent. This produces a definite scheme with a dominant hue. Some triads have less brilliancy than others, but it is best, even so, to select one of the hues to dominate. Schemes 55 to 57, Plate 13, illustrate this point, though rather imperfectly.

When a color scheme is based on a triad, one of the most certain ways of preventing rivalry between the basic colors is first to select one as a dominant and then to "veil" the other two with it. This veiling can be done either through superposition of washes, or admixture. In Scheme 58, Plate 13, for example, a red, yellow, blue triad was selected, with red dominant. A bit of this red was washed over both the yellow and the blue. To give further emphasis to the red, the veiled colors were used in light tints. Schemes 59 and 60 illustrate other veiled triads.

Even a single triad is capable of producing such a wide range of hues, and hence makes possible so many schemes, that little can be said about them to help the beginner. In the next chapter we shall, however, offer a few practical pointers.

CLASSIFICATION We have already made clear that generally no definite line of demarca-

tion can be drawn between color schemes. Several kinds of schemes are often combined in a single painting; many schemes are so complex that they could easily be classified in a number of ways.

Take, for instance, the unusually effective presentation by H. Raymond Bishop, shown as Plate 19. Considered in a broad sense, this is simply a complementary scheme which might loosely be described as an orange building against a blue background, the latter predominating in area. On closer scrutiny, we see that this really consists of one analogous group of colors balancing another. A large proportion of the paper surface is covered with a blue, green, violet analogy, with blue predominant. These cool colors throw into sharp relief the building, which is rendered mainly in combinations of analogous yellow, orange, and red, of which yellow-orange predominates.

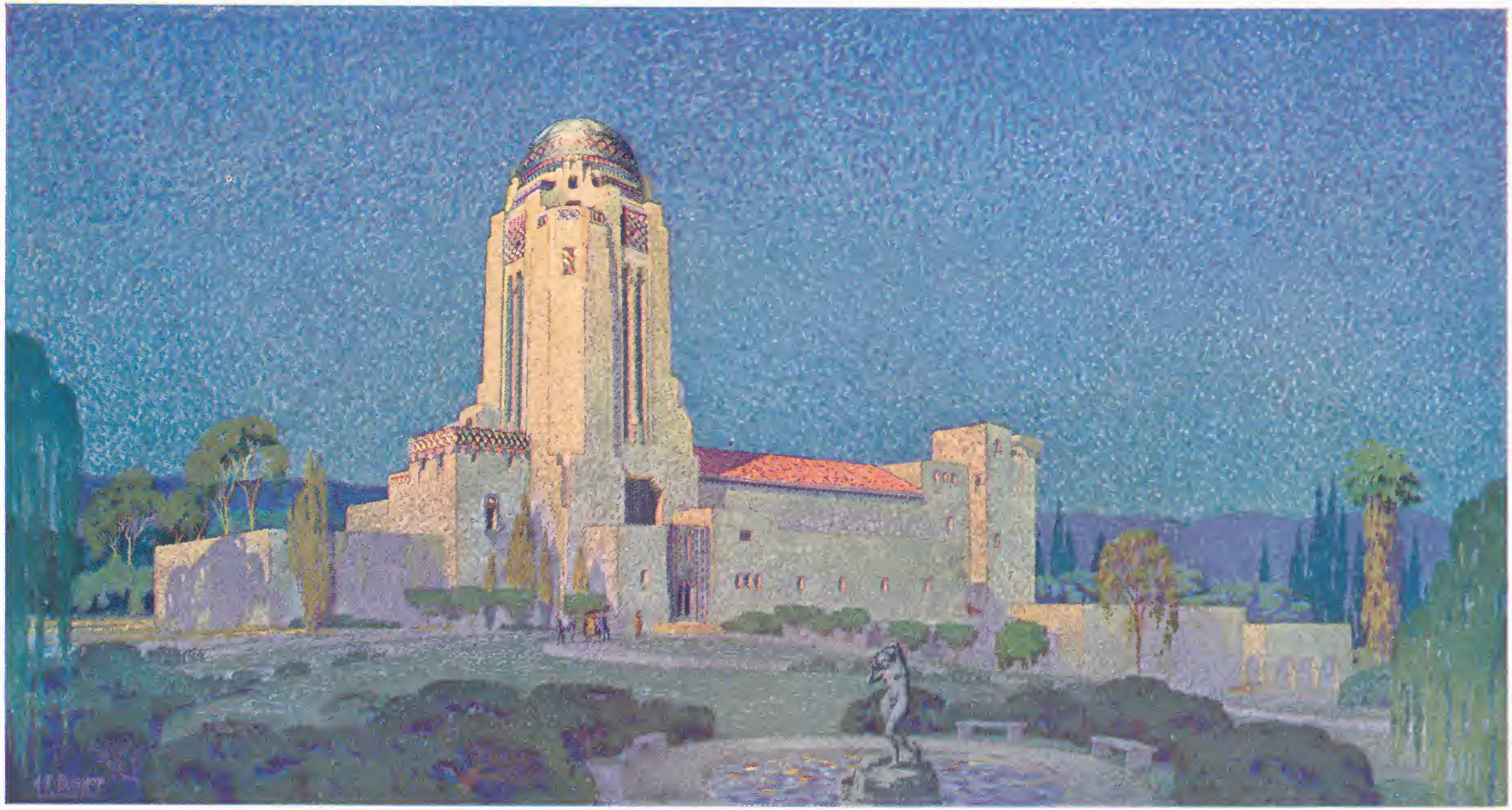
We particularly direct the attention of the architectural reader to this scheme of a central area of warm colors surrounded by a ring of cool colors, for, with variations, it is the most common color arrangement employed in exterior architectural representation.

This drawing by Bishop also stands as an excellent illustration of the fact that arrangement and area have much to do with the successful use of color. For here, with the same colors with which the beginner often makes very inferior drawings, a striking and highly pleasing effect has been obtained, and one which well serves its purpose, for the building, and especially the tower, commands attention much as though a searchlight were thrown upon it.

It is interesting to point out that some of Maxfield Parrish's brilliant paintings which have proven so popular are based on this same general scheme. This can also be said of many of our other drawings in this volume, including those by Jean Jacques Haffner (page 134) and O. R. Freeman (page 300).

One must realize that pleasing effects depend as much on value and intensity as on hue. These drawings just mentioned would be satisfactory even if reproduced in black and white, proving that good hue arrangement is by no means their only virtue.

A "PLAY SAFE" METHOD When it comes to color arrangement, if the artist wishes to secure chromatic balance simply and quickly, he can often employ the means suggested by George W. Neff's brilliant sketch, Plate 20, so distributing each of his leading hues as to weave more or less of an all over color pattern. Many of our illustrations (see Chapter XV) utilize to some extent this general method.



RENDERING IN OPAQUE WATER COLOR BY H. RAYMOND BISHOP—PASADENA ART INSTITUTE, CLARENCE STEIN, ARCHITECT

Despite great opulence of hue, the effect is mainly complementary, with blue predominant. Original, 44" x 24"

FREE WATER COLOR SKETCH BY GEORGE W. NEFF

The colors here are so distributed as to guarantee chromatic balance. Original, 14" x 20"

CHAPTER XII

MINGLINGS AND THEIR APPLICATION

AND HINTS ON DEVELOPING THE AESTHETIC SENSE

We now come to a series of exercises which, in addition to reinforcing the student's knowledge of color mixture and arrangement, reveal color schemes suited to numerous applications.

MINGLINGS Each of these consists of making a "mingling," or partial mixture, of two or more pigments on wet paper, so that they produce, in a comparatively small area, a maximum variety of hues, values, intensities, and textures.

EXERCISE 33: MONOCHROMATIC MINGLINGS This experiment is designed to give you a full realization of the astonishingly varied and complicated effects you can obtain merely by mixing individual hues with black. With Plate 21 as a guide, mingle with black, one at a time, at least the twelve normal hues of your color wheel. This can be done to advantage on a sheet of water color paper or board approximately 15″ x 22″ in size.

For the first of these, wet a rectangular area (about 3″ x 4″) in the upper left-hand corner of the sheet, which must be laid flat; you need not work to definite boundary lines, which are an unnecessary handicap. Into this puddle or very wet area, shake a few drops of intense red and black pigment and allow them to spread. Manipulate them with the brush so in places they retain their full strength while in others they blend quite freely or are greatly diluted: part of the paper should remain white. It sometimes helps to rock the board or tip it or even to blow the pigment in the desired direction in order better to control the results.

Make a second mingling of the same colors, perhaps beneath the first, scrubbing it when dry (Plate 21) to produce softer tones. Or gray and slightly diluted red can be substituted for the previous black and intense red. Similar subdued minglings of all other recommended combinations would prove valuable, too.

The remaining minglings on the sheet should be handled like the first. Many of the combinations which develop will suggest possibilities for adaptation in paintings. Some will look like clouds or sunsets; others like foliage or flame; others like fabrics, marble, etc. You will learn that such mingling offers a definite way of applying pigment, capable of results quite as important as those obtainable through wash.

Next, do a second sheet similar to the first, substituting other colors and perhaps a different black. Try black ink; it is capable of surprisingly brilliant effects. By surrounding bright spots of color with the black—particularly the lighter hues such as yellow—striking contrasts can be formed.

EXERCISE 34: MINGLED PAIRS With monochromatic arrangements disposed of, such two-hue combinations as we picture on Plate 22 come logically to our attention. Make minglings based on all the combinations of this chart. You will be amazed at the variety you can obtain through mingling a single pair of intense hues, especially when they are somewhat dissimilar.

EXERCISE 35: THREE-COLOR MINGLINGS Plate 24, which stands as a guide for another sheet of student minglings, suggests the endless combinations which are possible when three hues are employed. Make similar minglings with your own colors. Try some of the veiled and scrubbed type; this process brings the colors together, creating soft and sometimes extremely beautiful harmonies. Don't do any of this work in a perfunctory way; carry out these exercises conscientiously. Try to memorize some of the best effects. Save all these sheets, too, for future reference, with the names of the component hues noted.

EXERCISE 36: COLOR SCHEMES Now base simple color schemes on some of your minglings, as a test of their practicability in this direction. Plate 25 offers suggestions. It is generally best to select for a color scheme only a few of the tones visible in any one mingling, and, as a means of accomplishing this, lay finders such as we have already described—strips of paper with holes through

them a quarter-inch to a half-inch in size—on the mingling and shift them, experimentally, until a pleasing combination of hues is revealed, the remainder of the colored areas being hidden from view. With these finders clipped in place you are ready to proceed with a drawing or design inspired by the scheme thus revealed. The applied schemes on Plate 25 were developed in this manner.

There are some students who feel at a loss to know how to select harmonious schemes, even with pleasing minglings before them. They shove the finders around, conscientiously, but hesitate to fix on anything definite. The author scarcely knows how to aid them. Perhaps the following remarks may prove of some assistance.

THE AESTHETIC INSTINCT Lacking the guidance of definite rules and regulations for color harmony, the student can rely to a considerable extent on what we rather loosely term the aesthetic instinct, or "the eye." This vague, subconscious power helps him in many ways. Strangely he can often depend on it more than on his conscious judgment. Though it varies greatly in different individuals, it is present to a marked degree in most of us who feel an interest in painting (possibly it is a cause of that interest), and, even among those who lack it most, it is susceptible of cultivation. The comparatively undeveloped instinct of the mere novice is frequently of far more use to him than much of the rule and regulation which he consciously acquires. Though the author would be the last to belittle the valuable things which the student can be taught, he feels the latter would be unwise indeed to put this knowledge wholly above his instinct. In selecting schemes from minglings, for example, he should place great reliance on this power, choosing the colors which his "eye" tells him are right.

When it comes to painting, let him fearlessly apply his color; his advance will be faster and more substantial than if he weighs every move and so proceeds with too great conservatism. Once he has a number of colors on his paper he will usually recognize those which are discordant or unpleasant. He may not know the why of the discordance (though it would be well for him to try to analyse it) but if he discerns it he can change or remove the offending pigments. Even the professional artist relies to a surprising degree on this subconscious sense, applying hue after hue more or less intuitively. If anything chromatically offensive develops, his intuition gives warning, and he makes the necessary changes before going on.

This bold method of working, with reliance on instinct or the "eye," strengthens that instinct. In fact it seems that anything which one does to further his knowledge or appreciation of color reacts in this advantageous manner. We have spoken of the value to be derived from investigation of the laws of science; one's understanding of color can also be broadened through a study of nature.

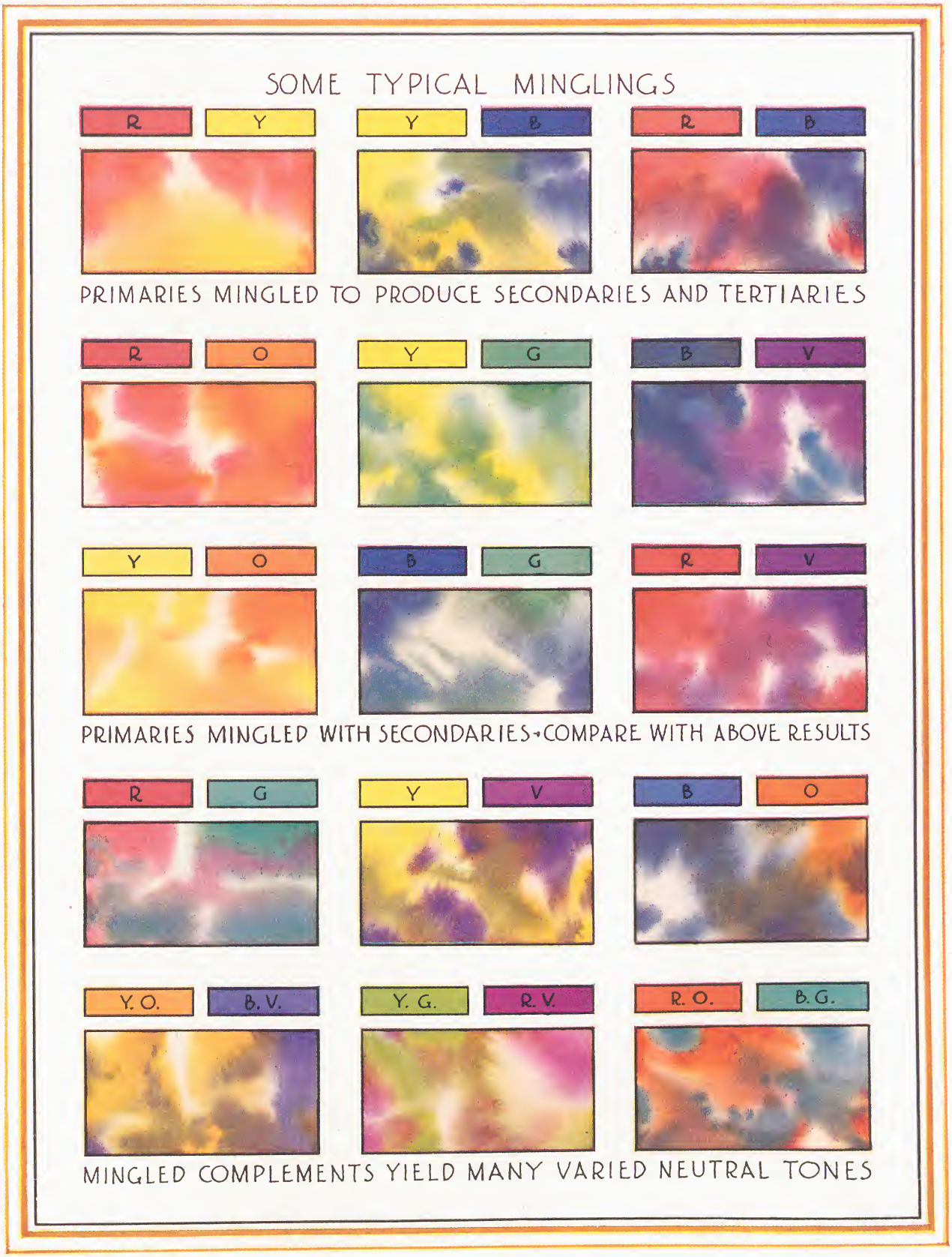
For nature, though not all perfection, as some writers would have us believe, is a never-failing source of color harmonies and so always of interest to the painter. The student should early acquire the habit of sketching from nature (see Chapter XVIII) and of studying her ever-changing hues with the thought in mind of their interpretation in pigment form. It is a splendid practice to carry a little white cardboard with a rectangular opening in the center perhaps an inch and a half by two inches in size, holding it upright, as a finder, peeking through it with one eye closed, selecting pleasing "pictures" much as is done with the viewfinder of the camera. By comparing visible hues with the white of the card it is easy, after a bit of practice, to estimate what pigments would be necessary for their representation.

Works of art are also splendid illustrations of color harmony. As Walter Sargent points out: "Familiarity with these educates our eyes as good music does our ears, and develops our discrimination and enjoyment beyond what can be gained in any other way. Works of art show us in perfected form what we are striving to attain in our experiments with color, and thus give a new meaning to our more or less crude results. The combinations of color in nature are often beautiful but are complicated with other interests, and the harmonies, although highly suggestive, are seldom set forth as clearly as in art." In Chapter XV we point specifically to some of the ways in which one can profit from the work of other artists.

So much by way of emphasis on color aesthetics. One particularly interested in this phase of color study should turn to such a book as Sargent's *The Enjoyment and Use of Color* from which the above quotation was selected. This is a volume of great value, which the author recommends without reservation.

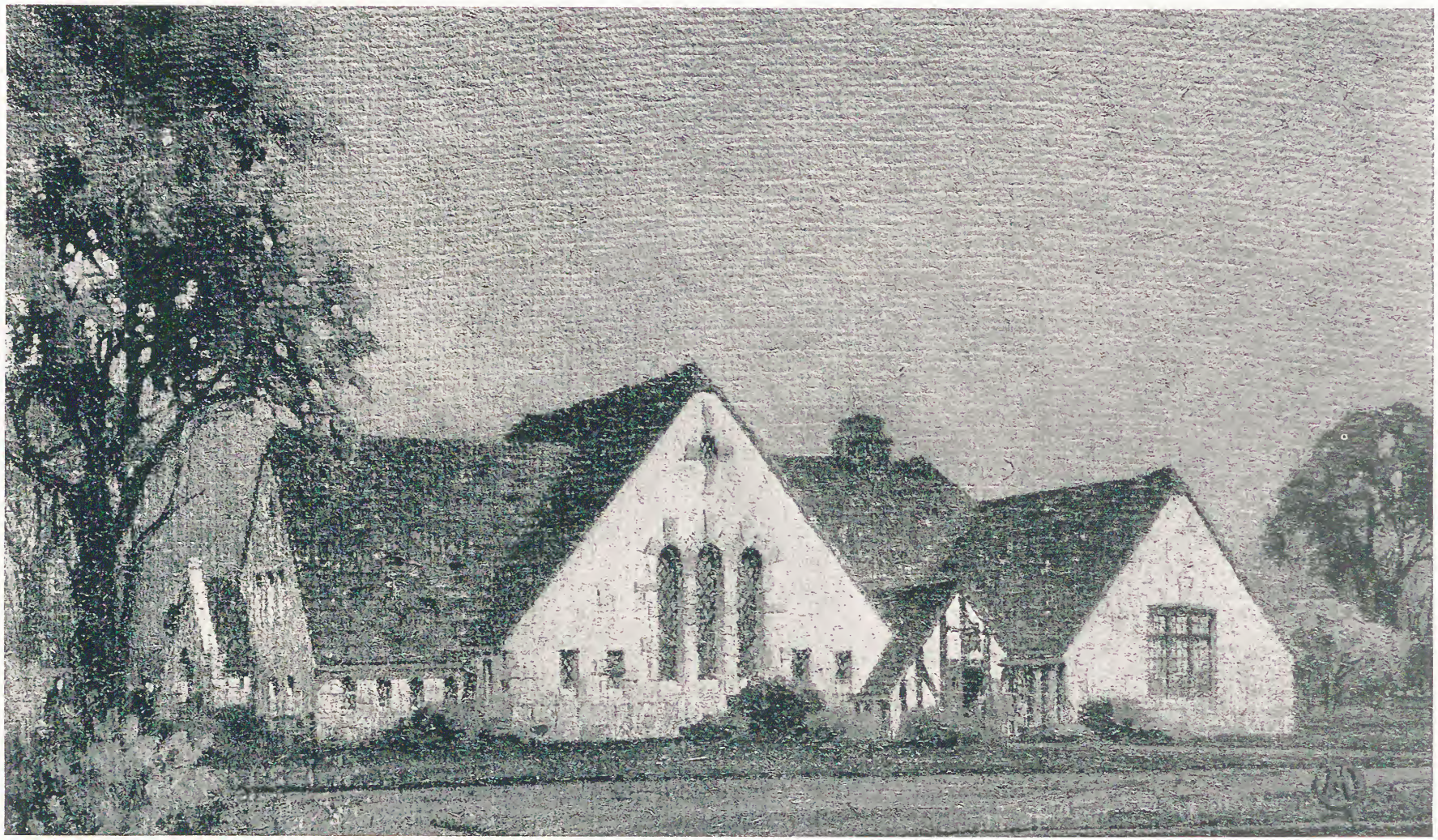
MONOCHROMATIC MINGLINGS REVEAL A SURPRISING WEALTH OF TONE

The student should make many, each several inches in size



MINGLED PAIRS OF COLORS PRODUCE COUNTLESS OTHER COLORS

Through such minglings one best learns the art of color mixture



RENDERING IN HEAVY OPAQUE WATER COLORS ON A ROUGH BOARD, BY OTHO McCRACKIN

Observe the interest which the texture of this unique drawing surface creates

CHAPTER XIII

THE REPRESENTATION OF TEXTURES

TRICKS OF THE PROFESSIONAL ARTIST EXPLAINED

As a final preliminary to our first exercises in representative painting, we now offer a group of experiments designed to acquaint the reader with various means of securing effects of texture, as well as to show certain unique methods of applying water colors and related media.

TEXTURES We have already mentioned that truthful representation depends as much on the appropriate and adequate indication of the various textures of a subject as on the treatment of its light and shade or color. Furthermore, we like textures for their own sake. As an exemplification of this latter point, see Plate 23, reproducing one of Otho McCrackin's splendid studies. Obviously no sky ever presented the type of texture here shown, yet it pleases us.

EXERCISE 37: PAPERS Paper surface can play a great part in texture representation. At the top of Plate 26 are shown samples of five standard papers, all washed with the same mixture of French blue. Compare these. No two look exactly alike. Try your own pigments on a variety of papers, saving the most interesting results as suggestions for later application.

PIGMENTS In making your pigment acquaintance practice sheets based on Plates 5 and 6, you learned that pigments, too, vary in their textural characteristics.

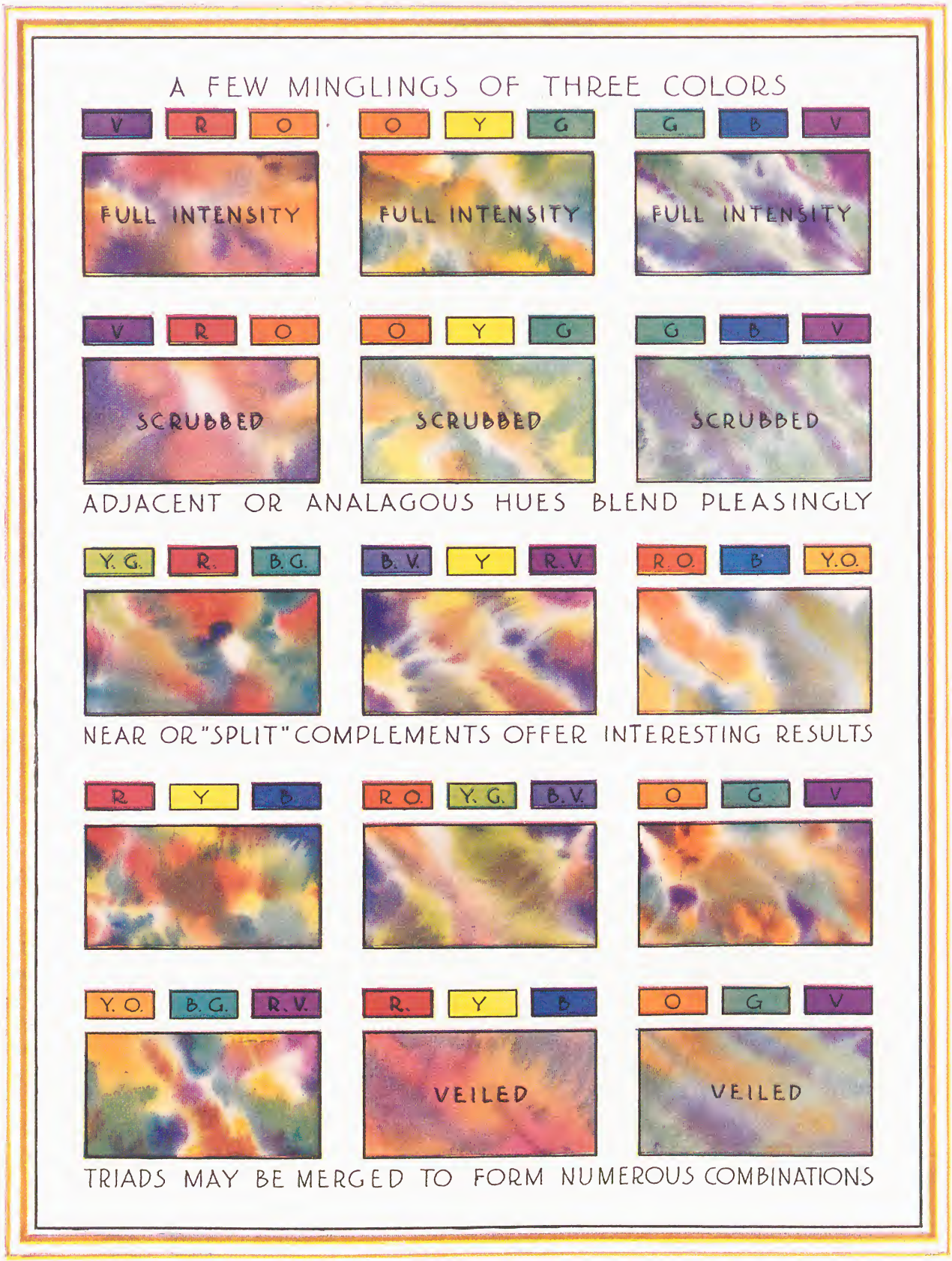
APPLICATION You have also discovered that the manner of pigment application (tilt of board, method of brush manipulation, etc.) has much to do with the texture of your tones.

Most students sooner or later discover that their pigments, papers, and methods of working give them this wide variety, but they too seldom take the time to experiment deliberately in this direction. Yet to do so means time saved in the end.

EXERCISE 38: CLEAR AND SEDIMENT WASHES You *must* know which of your pigments give clear washes and which the type variously known as "sediment," "settlement," "deposing," "granulated," or "precipitated." The sediment washes, though disastrous when not wanted, are extremely useful for many purposes. Plate 26 shows quite a number employed singly, in mixtures, or superposed. Pigments in combination often develop far more sediment than when used singly, especially when both tend to depose. Burnt sienna and French blue (see 7 and 10) are capable of producing astonishing granular effects. Even smooth papers to which this combination has been applied often look rough. If the board is kept nearly flat while such washes are run, the separation is likely to be increased, emphasizing the granular character. Sometimes, to secure the effect, the board is actually rocked back and forth. Experiment with all this sort of thing, and try to memorize the results.

EXERCISE 39: DOCTORED WASHES Even after washes are dry they can be treated in various ways to increase their interest or suitability to purpose. On a heavily grained surface, such as that of the Morilla paper which was used in several of these examples, striking results can be obtained if the "hills" are scrubbed, erased, or otherwise lightened. This we illustrate at 1, Plate 27, where sandpaper was utilized to give the effect at the right. Try this.

A razor blade or knife may also be employed, before or after the pigment is applied. Figure 2 reproduces an area which was painted, then scratched, then superposed with other colors. The wash at 3 explains itself, as does the rest of the sheet. Study Figure 8 in particular, as this method is pregnant with possibilities. The crumbs, resulting from ordinary erasure, were sprinkled on the paper and a mixture of burnt sienna and French blue was floated over them. When dry, the crumbs were brushed away. This trick is most effective in representations of antique stone fragments. By the addition of emerald green one can obtain marvelous suggestions of oxidized copper or the encrusted patina of ancient



MINGLING, LIKE WASH LAYING, IS A COMMON WAY OF APPLYING PIGMENT

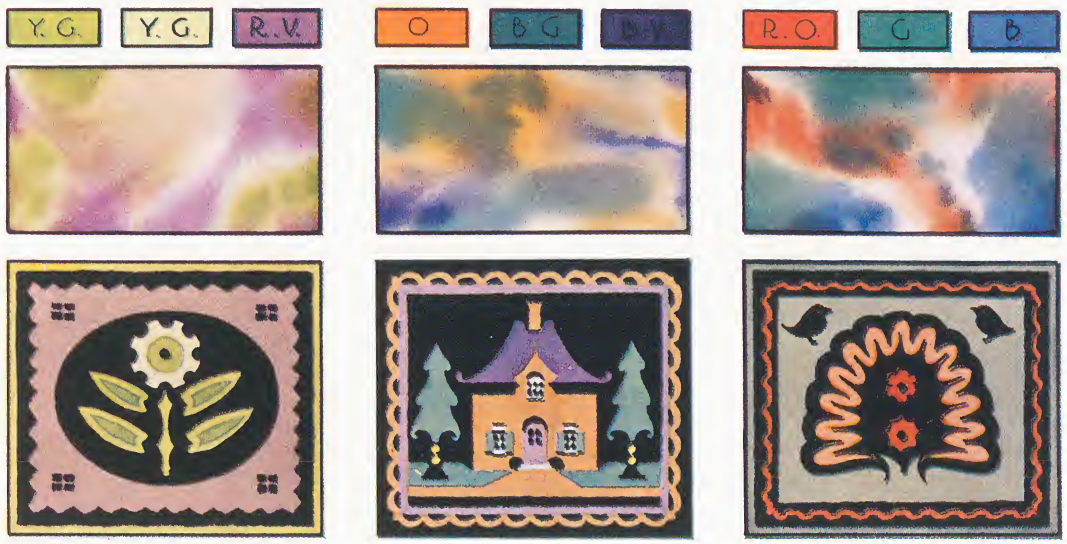
Observe the sky-like effect in the upper right-hand example

APPLIED COLOR SCHEMES BASED ON MINGLINGS

COLOR SCHEME 1
A MONOCHROMATIC SCHEME OF SEVERAL VALUES OF ONE HUE

COLOR SCHEME 2
AN ANALAGOUS HARMONY WITH RED DOMINANT IN AREA AND INTENSITY

COLOR SCHEME 3
AN ANALAGOUS SCHEME WITH ACCENTS OF THE DOMINANT'S COMPLEMENT



COLOR SCHEME 4
COMPLEMENTARY SCHEME USING INTENSE DOMINANT AND GRAYED COMPLEMENT

COLOR SCHEME 5
CONTRASTING A DOMINANT WITH NEUTRALIZED NEAR OR SPLIT COMPLEMENTS

COLOR SCHEME 6
A TRIAD WITH DOMINANT EMPLOYED FOR VEILING OTHER COMPONENTS

MINGLINGS ARE USEFUL IN DETERMINING COLOR HARMONIES

MINGLINGS REVEAL INNUMERABLE APPLICABLE HARMONIES OF COLOR

Too many students fail to explore this field sufficiently

bronze. Try all these methods and others of your own invention; there is no better way of extending power over your medium.

SCRUBBING A word more about scrubbing. Not only are occasional washes scrubbed for the development of texture, but entire water color drawings are frequently developed by the "scrub" method. Usually the surfaces (smooth paper is popular) are washed over with brilliant pigments (the scrubbing being anticipated) and when thoroughly dry they are scrubbed in whole or in part with a sponge, rag, or a bristle brush. After this they are touched up by means of thin washes and a few accents here and there. Some artists repeatedly wash down and build up, taking their drawings to the sink if necessary. Even soap is employed if certain colors are too resistant. Others work more delicately, merely dampening and blending their colors with a soft brush, or picking out highlights. Beautiful effects not otherwise obtainable are produced by such methods. Artists who prefer the more popular "direct" method emphasized in this volume, often resort to scrubbing if paintings reach a more or less hopeless stage. Or an area is dampened and a bit of color is "lifted" by means of the blotter. The author prefers sandpapering to scrubbing for many areas which are a bit too dark, as the process is less mussy. For a further word on scrubbing, see Chapter XVI.

EXERCISE 40: UNIQUE METHODS Plate 29, which explains itself quite well, opens further fields for experimentation. The student should explore these, later applying the various tricks as occasion arises. The upper row of rectangles demonstrates to what extent such media as crayon, charcoal, and ink are sometimes used in conjunction with water color. Charcoal and soft pencil are customarily sprayed with fixatif before the washes are applied. Chapter XXVII goes into such matters more thoroughly; scattered throughout our volume are numerous drawings based on these or other combinations of media.

BROKEN COLOR We have seen (Chapter V) that water color pigments are often applied to the paper in the form of washes. In the last chapter we learned that it can be dropped into place and allowed to mingle. In Chapter XXIV we shall discuss the employment of spatter and spray. Just now we wish to emphasize what is known as "broken" color, for in its use we discover a new means of pigment application.

If we turn to nature for color inspiration we find comparatively few areas of flat, solid color. Practically everywhere we see an astonishing variety of both hue and texture. Paintings must frequently show like variety. Often the artist takes advantage of the roughness of his paper to "break" his color with little spots of white, as demonstrated at 1, Plate 29. By combining various colors thus broken with white, pleasing effects are obtainable. Plate 30, reproducing a vigorous sketch by Lionel H. Pries, presents a practical application of much this type of tone. Study Plate 32, too, as another splendid example of texture representation.

Figure 2, Plate 29, shows broken color applied in a unique manner, for a damp brush was dipped in (or, rather, touched to) red and blue pigments simultaneously, and then so stroked across the paper as to leave whites here and there. In Figure 3, two brushes were dipped separately and then used together, held with the ferrules touching. This trick is convenient when painting grass, waves, etc. Figure 4, though labeled as stipple, more properly pictures the employment of dabs or crosshatch of color. For occasional problems this technique is splendid. Figure 8 shows us an unusually interesting example of broken color done with a small sponge dipped into several hues at once. The paper was rough. In similar effects, known as "dry brush" work, a brush not too full of paint is substituted for the sponge. In Figure 6 we have a still different type, a brush, previously touched to several colors, having been rolled along with its point in contact with the paper. Architectural renderers sometimes represent marble in this manner. At 7 we see another application of the same method, this time with a single color.

Stipple is of many kinds, Figure 5 picturing a typical example. Sketch 9 offers a less common but very rapid type. We will later come to many applications.

EXERCISE 41 Experiment with all these stunts. They will eventually prove very useful. More will be said about texture representation and technical tricks as we go on. There are also many splendid suggestions in Richmond and Littlejohns' *The Technique of Water Colour Painting* (Pitman, London). This would be a fine time to study them.

CHAPTER XIV

PROFITING FROM THE PHOTOGRAPH

A CONSIDERATION OF SOME OF ITS VARIED USES

Now, having disposed of our preliminaries, we are ready to begin the representation of actual subjects. But where to start? There is considerable divergence of opinion as to the best point. Still-life painting has much to recommend it, and should not long be postponed (see Chapter XVII). It presents so many new problems at the very outset, however, that the author, as the result of years of classroom experience, is inclined to favor the temporary substitution of the uncolored photograph, the painting being done in monochromatic wash.

The chief virtue of the photograph, perhaps, is that it makes us realize that surprisingly adequate interpretations of all sorts of subjects can be arrived at without resort to a wealth of hue. For it reduces all things, including colors, to comparatively simple contrasts of light and dark, helping us to understand that values are as important as hues. This conclusion often escapes the beginner who works at once from objects. Again, the photograph not only lacks the confusing color which causes objects to seem so complex, but it is small enough so the eye can view it easily as a complete unit. It maintains the same appearance night and day, too, making it available at any time and place. Above all, it presents a great wealth of subject matter, allowing us to paint things nearby and far away, things huge and things small, things rounded and things angular, things rough and things smooth, etc., etc. It often distorts forms and values, however, and portrays many details so indefinitely that one cannot judge their true appearances.

SELECTING THE PHOTOGRAPH Choose simple, well-composed photographs of pleasing subject matter, reasonably distinct throughout. Picturesque scenes—dilapidated buildings, for instance—are usually easy to interpret (mistakes don't show plainly!) and have an almost universal appeal. They keep one, too, from trying to be painstakingly exact, inviting, instead, the desirable boldness. But pick any subject that you really like, so long as it is simple. Vary your subjects. Save good photographic material for future reference.

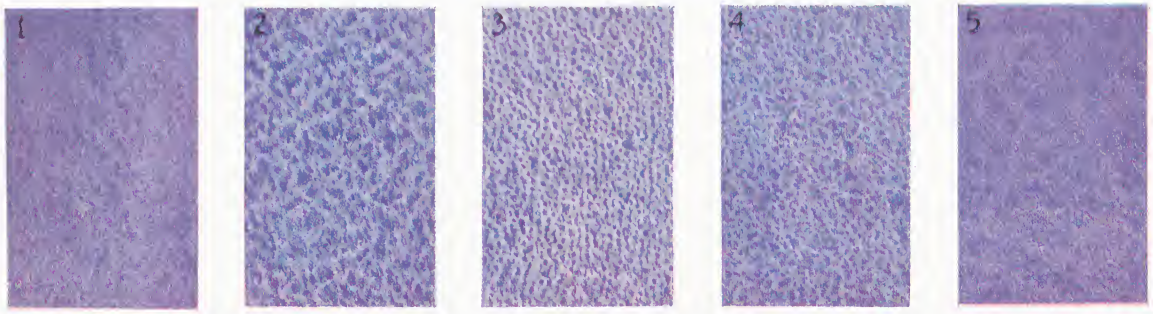
LIMITING THE SUBJECT Often a portion of a photograph is enough. Figure 51 suggests a useful means of determining a logical limitation. Two "L" shaped strips of paper are overlapped and moved about experimentally; with a pleasing subject discovered they are clipped into position, where they should remain until the completion of the drawing, hiding the adjacent areas which might otherwise prove distracting.

SKETCHING THE SUBJECT Now block out the main proportions lightly on suitable paper (it is usually advisable to enlarge them) with a medium pencil. It is presupposed that you already know how to do this. Don't tip the photograph so as to foreshorten it, or you will see the proportions incorrectly. It is best to place it vertically before you, as on the back edge of your drawing table. Hold your paper so you can view it approximately at right angles.

THE PIGMENT Sepia is popular for wash work, as is black. The old masters often used bistre (a warm brown) or sanguine (red). Blue is quite a common choice; gray-blue is pleasing. So select your pigment and prepare your accessories.

ANALYSING YOUR SUBJECT Never paint a subject without first analysing it. What are its main essentials, or, in other words, what things constitute its greatest appeal? These are the things to go after. Do some essentials seem too subordinate in the photo and some trivial things too prominent? If so, do not hesitate, as you paint, to make any adjustments consistent with your purpose. Note such vital matters as the direction of the light and the textures of the leading features. Are the values pleasingly disposed? Or are some too light or dark?

ADVANCING THE WORK With a gen-

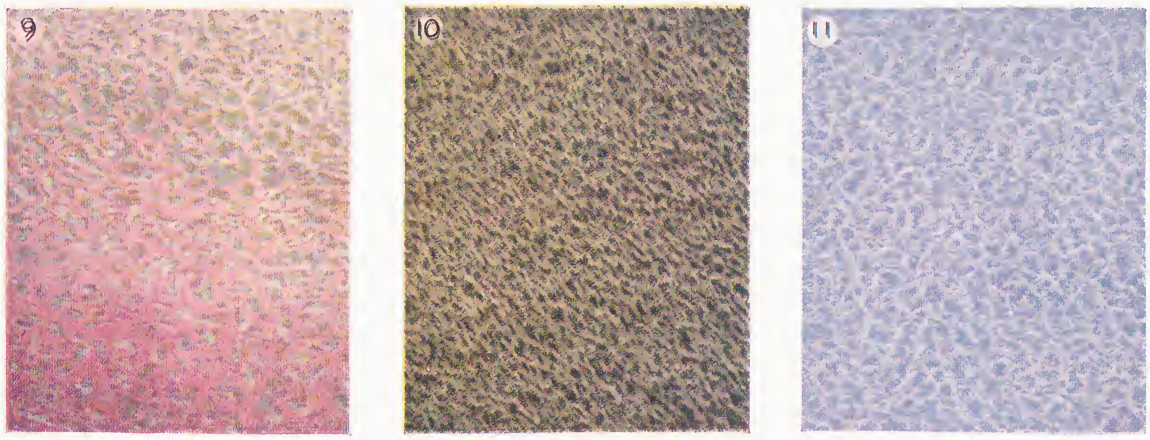


WHATMAN'S COLD PRESSED | "MORILLA" A GERMAN PAPER | PEBBLED "PARAGON" KEUFFEL & ESSER | "EGG SHELL" DEVOE & RAYNOLDS | "COQUILLE DEVOE & RAYNOLDS

SHOWING THE SAME MIXTURE APPLIED TO A VARIETY OF SURFACES

A WASH OF VERMILION ON "MORILLA" PAPER | BURNT SIENNA AND FRENCH BLUE ON WHATMAN'S C.P. | RAW SIENNA AND CERULEAN BLUE ON ROUGH WHATMAN

TYPICAL "SEDIMENT" OR "SETTLEMENT" WASHES (NOT SUPERPOSED)



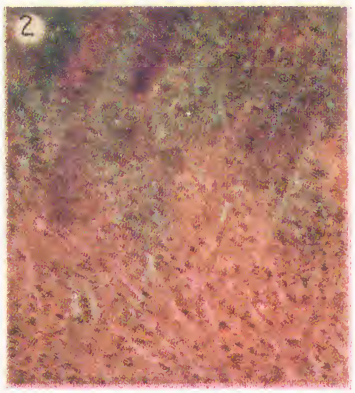
EMERALD GREEN OVER A WASH OF ROSE MADDER | FRENCH BLUE WASHED ACROSS BURNT SIENNA | CERULEAN BLUE OVER LIGHT ROSE MADDER

RESULTS OF SUPERPOSITION OF TWO OR MORE SEDIMENT WASHES

CERTAIN PIGMENTS AND PAPERS LEND THEMSELVES TO SUCH EFFECTS

The student must acquire familiarity with all this sort of work

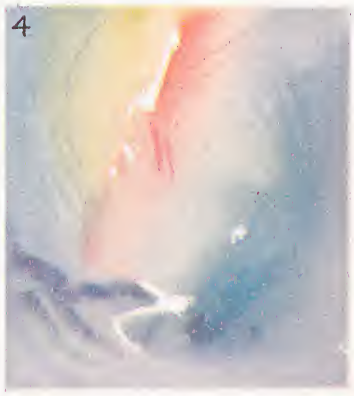
A SEDIMENT WASH WITH PORTION SANDPAPERED



SCRATCHED WITH KNIFE AND GLAZED WITH WASH

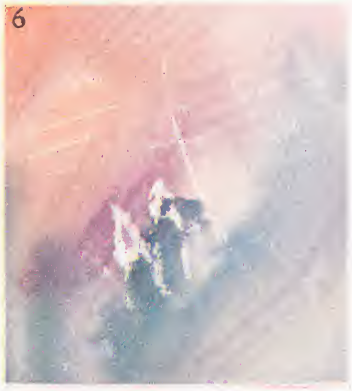
SANDPAPERED AND GLAZED WITH TRANSPARENT WASH

PAPERS MAY BE SANDPAPERED, OR SCRATCHED WITH THE KNIFE



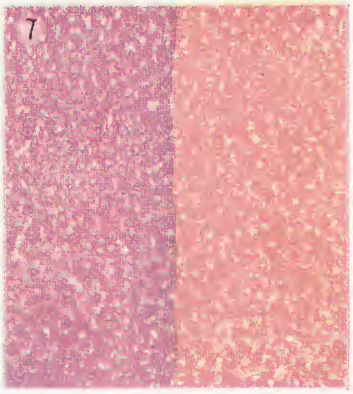
SCRATCHED BEFORE ANY PIGMENT WAS APPLIED

A WHITE WAX CRAYON CAUSED THE LIGHT LINES



BOTH KNIFE AND CRAYON WERE EMPLOYED HERE

THE KNIFE AND CRAYON WERE HERE USED BEFORE ANY WASHES WERE LAID



WAX CRAYON EVENLY APPLIED BEFORE WASHES

SEDIMENT WASH LAID OVER ERASER CRUMBS

CRAYON, AND SEDIMENT WASH, ALL SANDPAPERED

THERE IS ALMOST NO LIMIT TO THE VARIETY OF SUCH EFFECTS

A SELECTED GROUP OF TYPICAL TECHNICAL STUNTS

One must learn to make his materials obey his commands

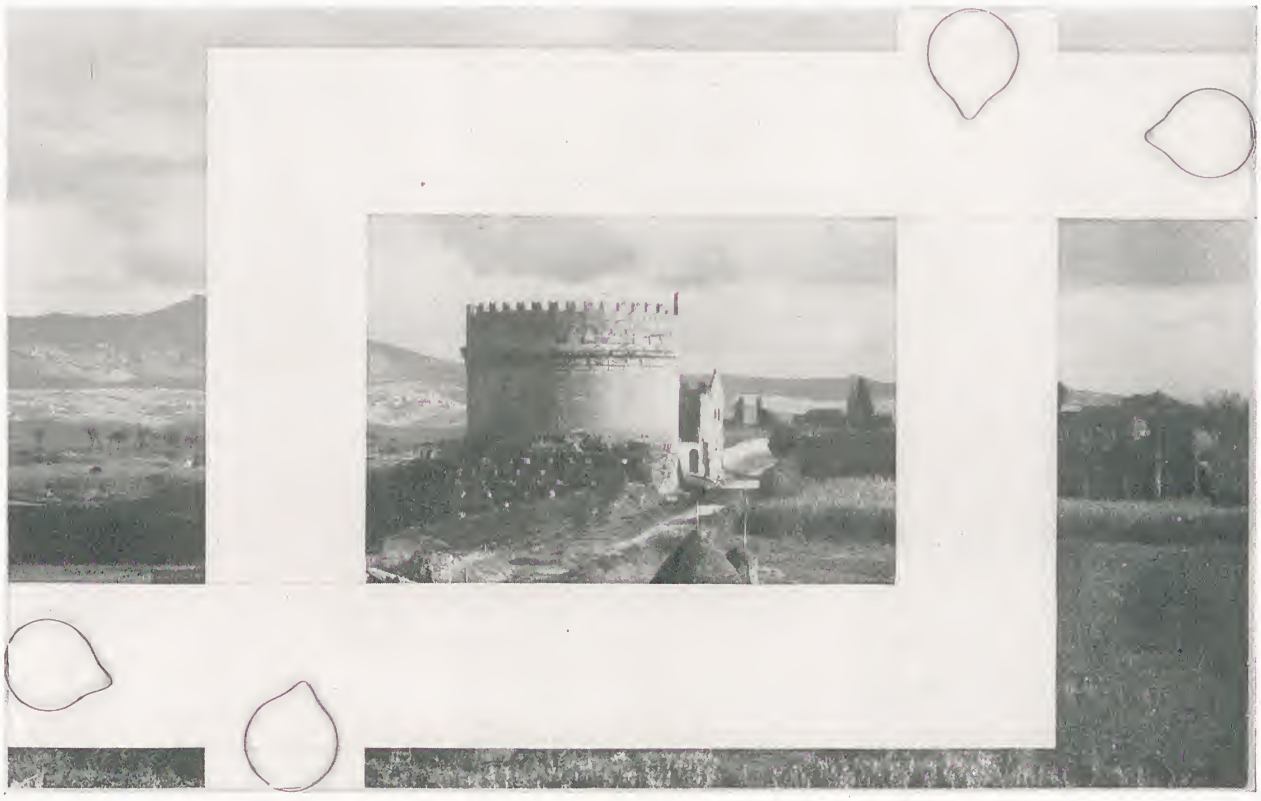


FIGURE 51

eral understanding of your subject acquired (and, if possible, with a plan of procedure mapped out), paint! Don't be afraid. Work as directly as you can. It is good practice in all water color painting to lay light tints first, then darker washes, and, finally, the darkest tones and accents. This prevents the mussiness which would result with the process reversed, causing the dark pigment to run when touched or superposed by another. Don't go over any given area more often than is necessary, for there is danger of losing the freshness and spontaneity for which water color is best known. Don't, however, complete a limited portion of your sketch at a time, but "keep the whole thing coming." This is because, as we learned in discussing simultaneous contrast, one cannot correctly judge a tone until the adjacent tones are in place. Figures 48 and 49, pages 61 and 62, show tones that seem lighter or darker than we know them to be. If ever in doubt as to the exact value of a given area, whether on your photograph or drawing, cut a small opening through white paper as a "finder" and study the tone through that, as contrasted with the white.

In applying your pigment, use the means which seems most natural. Wash it on, dab it on, mingle it, or draw with the end of your brush. Don't try to be too photographic, showing every slight gradation of tone and fussing over each detail. Interpret; suggest; indicate! A drawing which gives the appearance of having been done boldly (no matter how timid the artist may really be) creates, even though somewhat faulty, a better impression than one which is finicky and overworked.

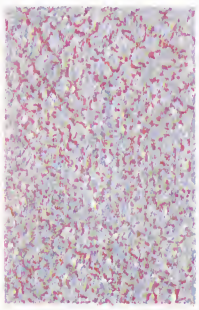
To reinforce this point, we refer to Plate 28, reproducing a drawing by Decaris. Here we have a masterly wash treatment which, though from nature rather than the photograph, involves the same principles and methods. There was no hesitation in arriving at this result; the artist was sure of himself and shows it everywhere.

APPARENT CARELESSNESS This sketch might appear to some beginners to be indifferently treated. Many of the washes, for example, are blurred and streaked. Are they not, however, highly expressive of the subject? Though to some extent accidental, they were intended to develop much as we find them. Intelligent thought and conscientious effort are behind every tone. It takes time for some students to learn to appreciate this "careful carelessness" and to differentiate it from mere slop such as we too often see.

"CHURCH OF NOTRE DAME AT BESANÇON"—WASH DRAWING BY DECARIS

Work of this type offers an ideal approach to work in full color

DARK CRAYON IS EFFECTIVE



COLORED PENCILS ARE USED

BLACK PENCILS PROVE HELPFUL

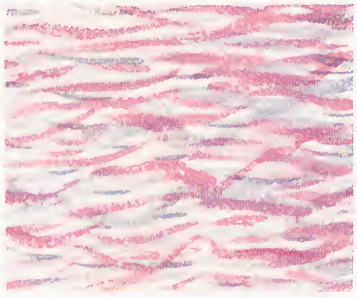
CHARCOAL HAS POSSIBILITIES

COLORED INKS ARE POPULAR

MANY OTHER MEDIUMS ARE USED IN CONJUNCTION WITH WATER COLOR

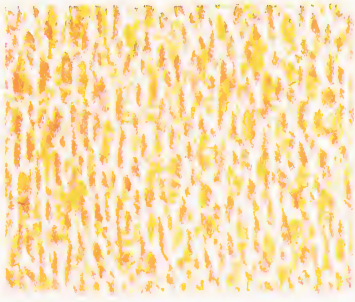
1. ROUGH PAPER

2. TWO HUES ON BRUSH

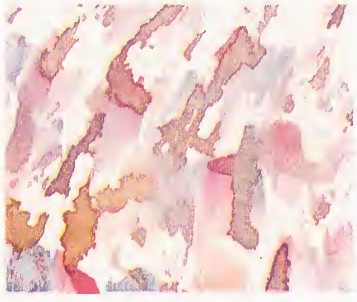


3. TWO BRUSHES TOGETHER

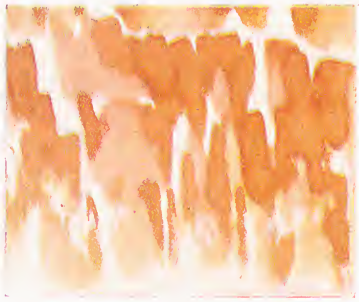
4. STIPPLE



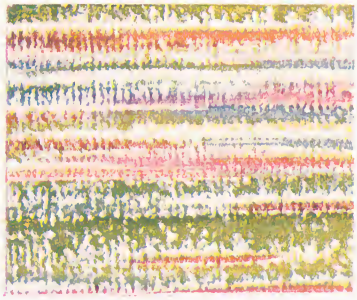
5. STIPPLE



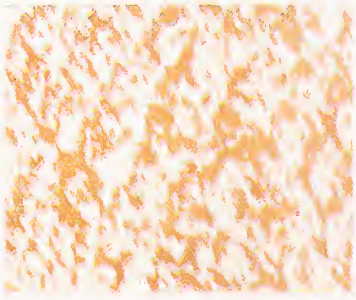
6. ROTATED BRUSH



7. ROTATED BRUSH



8. STRIPED WITH SPONGE



9. STIPPLED WITH SPONGE

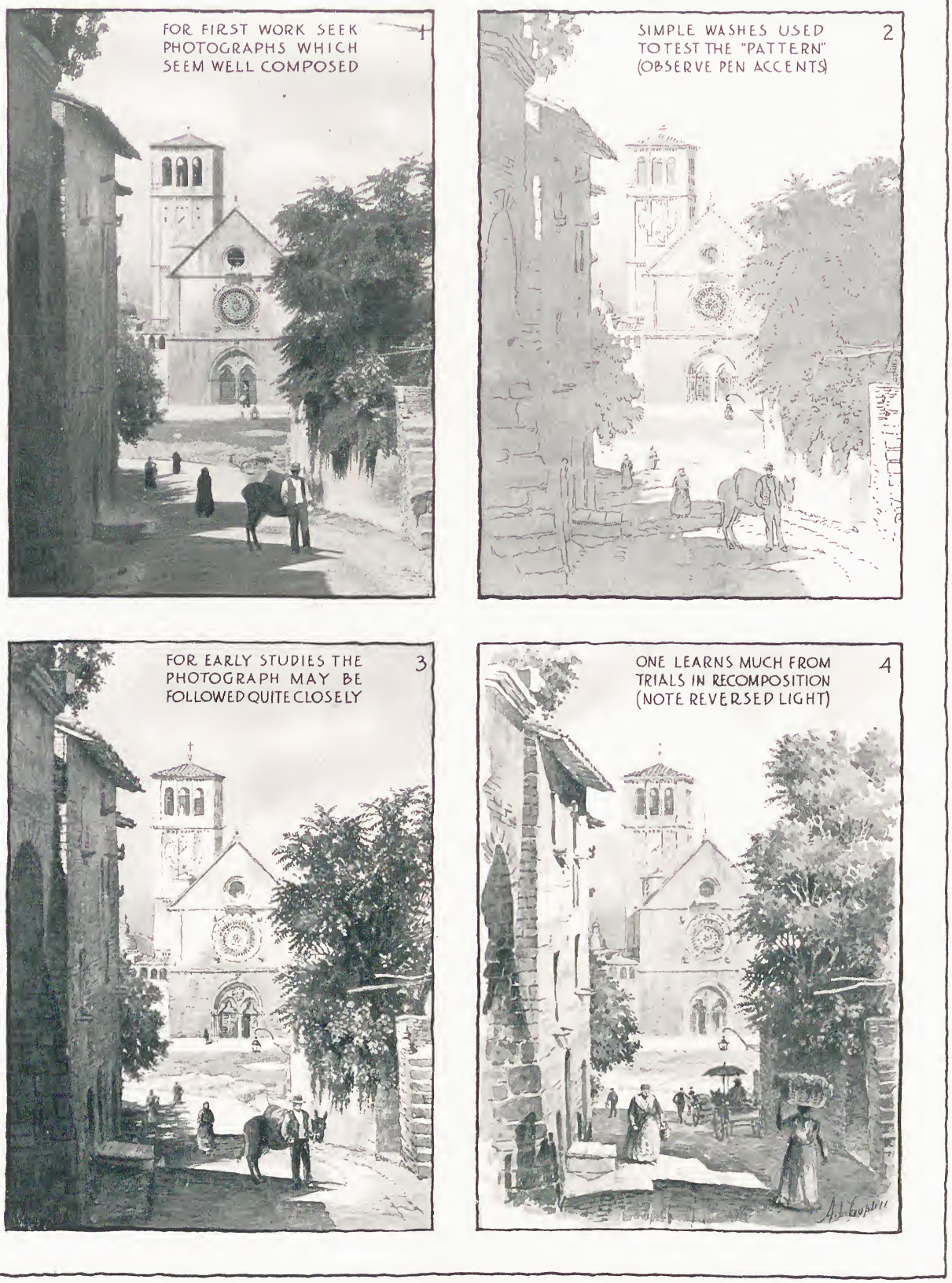
NUMEROUS METHODS ARE EMPLOYED FOR OBTAINING "BROKEN" COLOR

FURTHER SUGGESTIONS ON DIFFERENT MEANS OF APPLYING COLOR

These are the very methods on which many professional artists depend

A WATER COLOR OF CITTA CASELLI—PIAZZA SAN LORENZO, BY LIONEL H. PRIES

See how full advantage has been taken of the texture of the rough paper. Original, 13½" x 9½"


FOR FIRST WORK SEEK PHOTOGRAPHS WHICH SEEM WELL COMPOSED
1
SIMPLE WASHES USED TO TEST THE "PATTERN" (OBSERVE PEN ACCENTS)
2
FOR EARLY STUDIES THE PHOTOGRAPH MAY BE FOLLOWED QUITE CLOSELY
3
ONE LEARNS MUCH FROM TRIALS IN RECOMPOSITION (NOTE REVERSED LIGHT)
4

A PHOTOGRAPH AND SOME WASH INTERPRETATIONS

For some purposes the photograph, despite its faults, has advantages

CENTER OF INTEREST If we look at a subject in nature, that portion on which the eye is focused becomes, for the moment, all important. Things away from this focal point seem blurred. In making a drawing the artist customarily assumes he is thus focusing his attention in one fixed direction (usually on some feature of particular interest), and he emphasizes those things which fall within his range of vision. In wash drawing, he obtains this emphasis through the employment of strong contrasts of light and shade, and a full development of details. In color work, he also utilizes sharp contrasts of hue. Thus he creates a "center of interest." Away from this, he blurs his effects. The student is generally wise (there are always exceptions to these rules) to follow such a scheme, as it tends to unify his work. He should particularly avoid two or more competing centers of equal importance, as such rivalry destroys unity. There may be several centers of interest but one should predominate. See Chapter XXVI.

Sometimes, instead of a "center of interest," we have a "path of interest," the area of focus being expanded to include several principal, related features, one of which is usually emphasized to form a note dominating the whole.

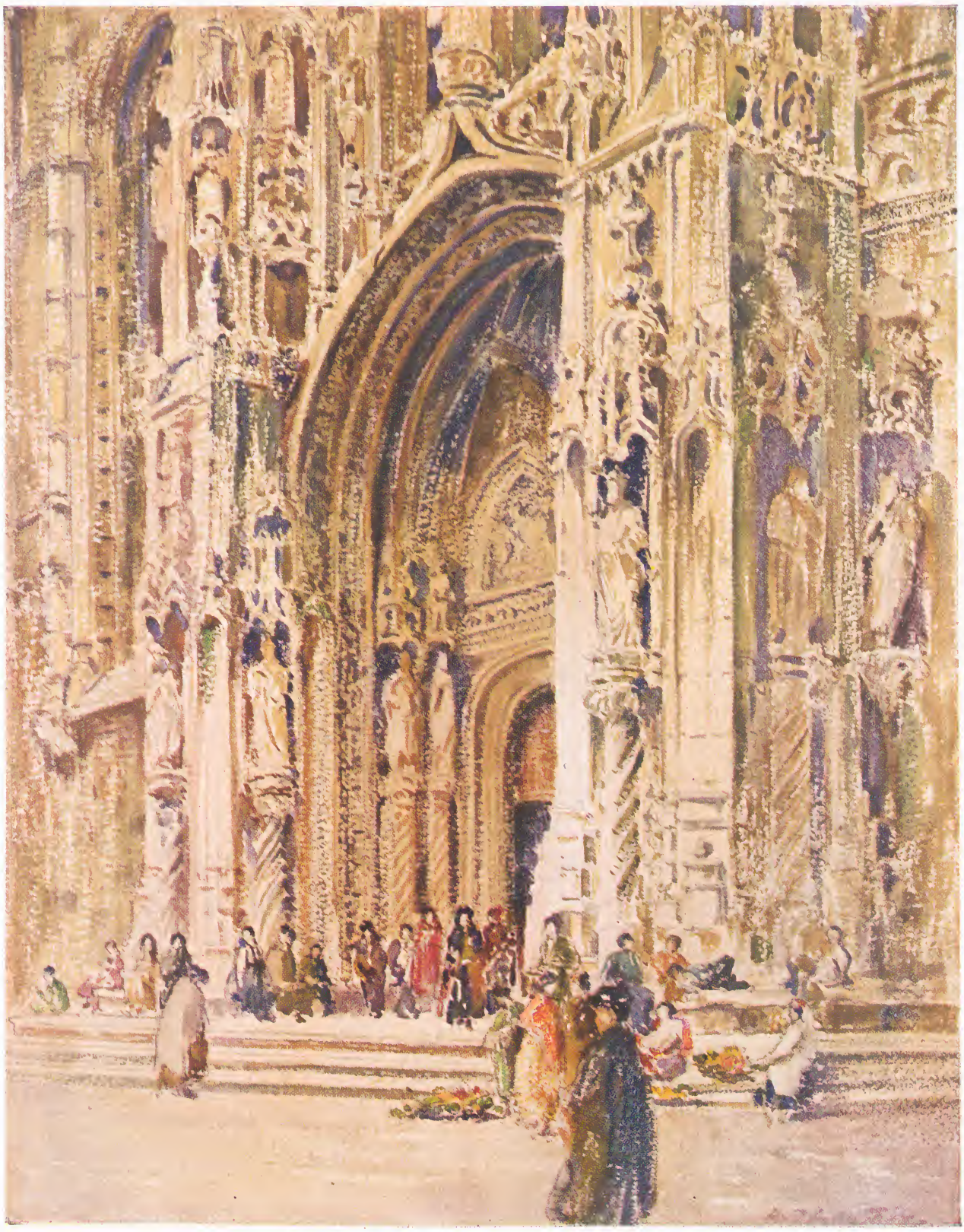
VIGNETTING In most water color work, whether in monochrome or full color, the subject is rendered all the way to the margins, though the corner areas are best kept inconspicuous. There are times, however, when a sketch fades to nothing towards the edges of the sheet; it is said to be "vignetted." Otto Eggers' rendering, page 166, is of this type. One exercises his choice in this matter.

When one vignettes a painting he must study the shape of the spot the whole thing forms on the paper, so as to make it pleasing. He must work, too, for variety of edge treatment.

PATTERN INTEREST Every drawing or painting—we often use the word "drawing" for "painting"—is, in a sense, a pattern or design, and just as we prefer one applied design to another (as in the case of fabrics, for instance) because it is more pleasing to our aesthetic taste, so we find that our appreciation of a sketch is often influenced by its pattern. Paintings in monochrome offer an excellent opportunity for first experimentation in this direction. If you plan every sketch with the idea of creating pattern interest you will soon learn practical methods. If an area seems empty from a pattern standpoint, for example, you can dab on a few brush marks. But don't feel you must crowd every inch of your paper with pattern. The relief of plain areas is necessary. In arranging your values you can keep this design quality in view, too. This is not a thing which need worry you immediately, for if you select good subjects, and render them honestly, pattern will probably take care of itself.

EXAMPLES Plate 31 was designed to illustrate some of these recent points. At 2 is a sketch (with dotted outline in diluted ink) of the photograph at 1. Pale washes were applied to reveal the natural pattern and afford a foundation for the later work. The photograph itself is relatively well composed, so little adjustment was necessary. Its interest centers in the church, which, light in value, is pleasingly contrasted with the dark masses of the foreground, which form a sort of enclosing "U." The converging lines of the street and nearby buildings also help to lead the eye to the center of interest. So, in the sketch at 3 (a continuation of 2) the photograph was followed quite closely, though not slavishly. The adjustments were mainly in the interest of greater expression of distance; note the softening of the darker accents in the church and figures. The sketch at 4 is introduced mainly to show that the artist need not feel handicapped by his subject as he finds it; he can make any such changes as seem logical. Here, great liberties were taken with the lighting, the values having been readjusted according to an altered direction of light, the buildings at the left, formerly in shadow, now becoming brilliantly illuminated, while the right-hand side of the street passes into gloom. The trees and figures have been recomposed, too. In this specific instance there was little point in these changes, beyond bringing the possibility to the reader's attention. All these sketches are perhaps too photographically exact, lacking the spontaneity which one gradually strives to develop.

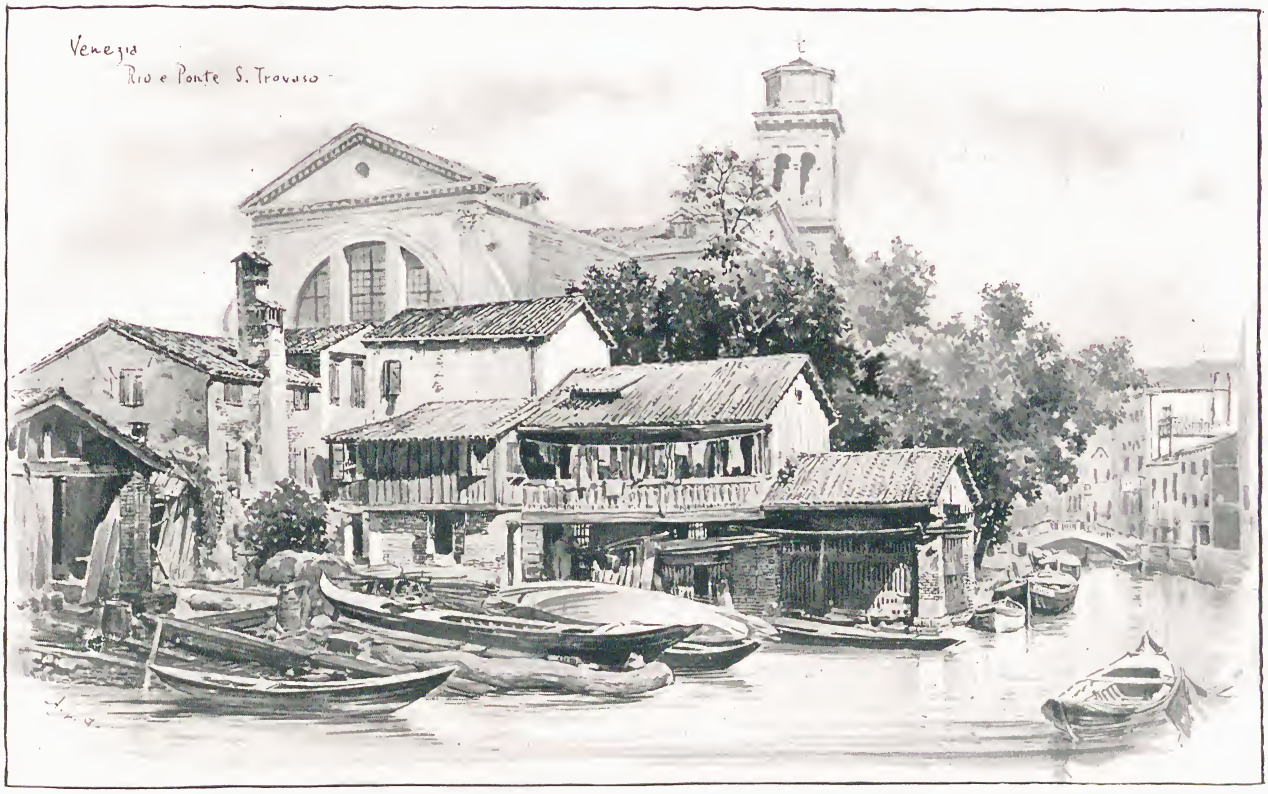
Plate 33 further exemplifies value recomposition, a stronger focal point than in the photograph having been developed in the sketch by creating sharper contrasts in the central areas and softer ones towards the edges. Nothing was omitted, the alterations being entirely value adjustments designed to make the whole more easily read, and particularly to draw the eye from the gable end of the church



"THE DOOR OF PARDON"—WATER COLOR DRAWING BY WILLIAM T. ARMSTRONG

The rough paper simplified the problem of suggesting the complicated detail. Original, 16" x 20"

A GOOD PHOTOGRAPH BUT LACKING IN DEFINITE CENTER OF INTEREST

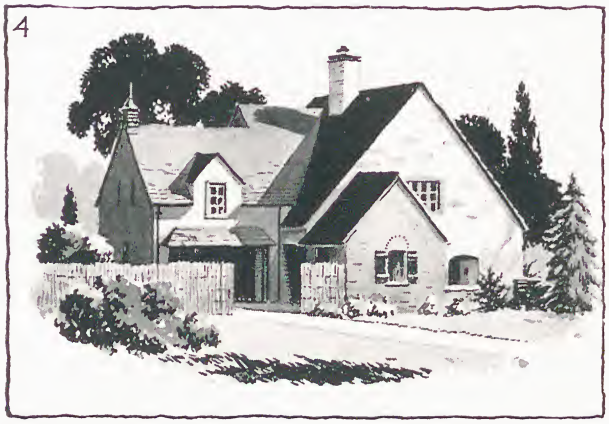


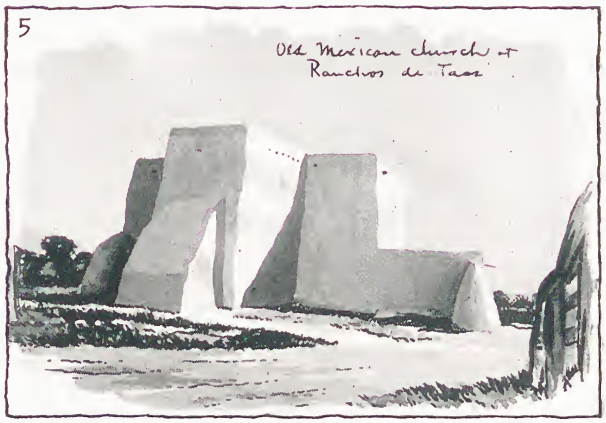
THE VALUES HAVE BEEN ALTERED TO CREATE CENTER OF INTEREST

PHOTOGRAPHS TEACH US THE IMPORTANCE OF VALUES

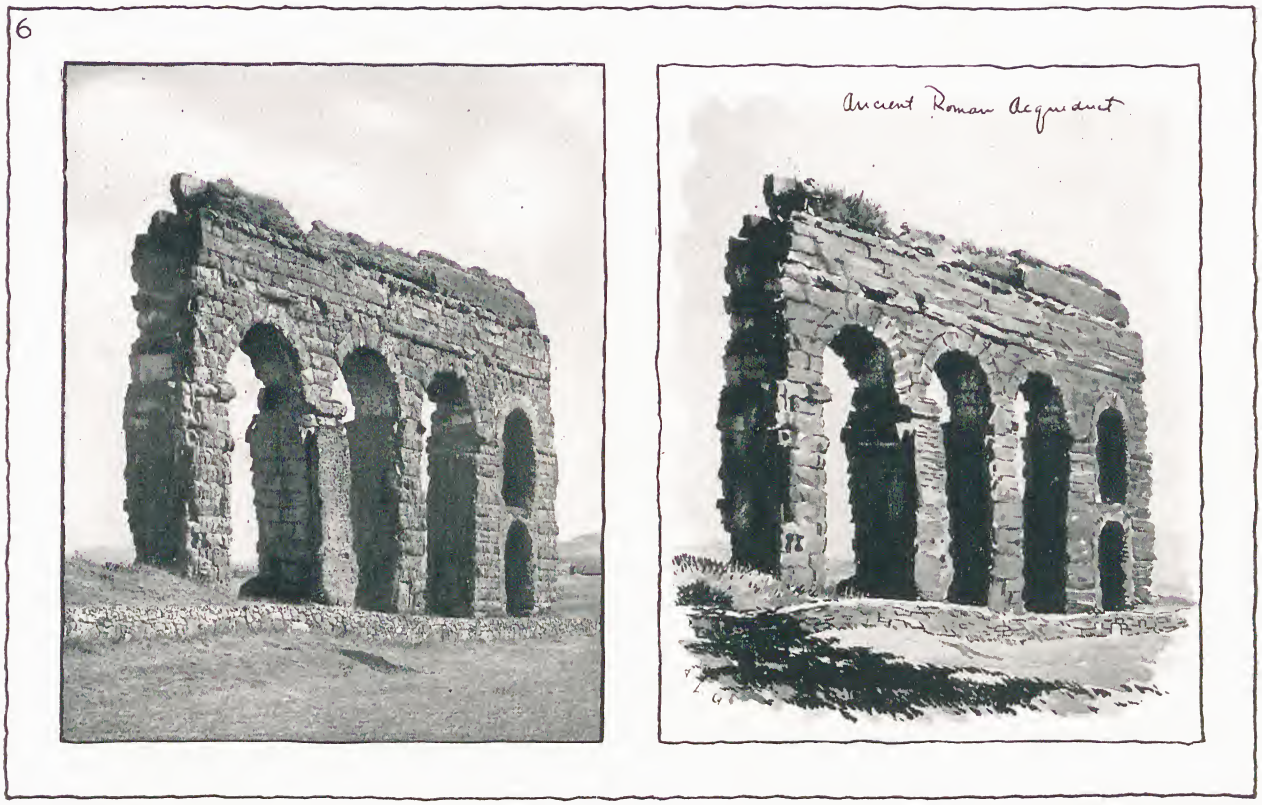
In the sketch little is omitted, but values have been adjusted

SOLID BLACK AND WHITE ARE CAPABLE OF SURPRISINGLY ADEQUATE RESULTS





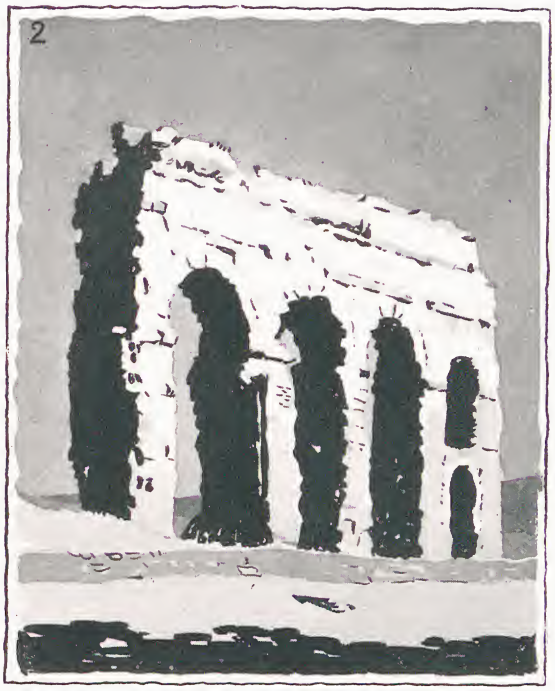
WITH BLACK, WHITE AND GRAY, ONE HAS ALMOST UNLIMITED OPPORTUNITIES



IT IS EXCELLENT PRACTICE TO INTERPRET PHOTOGRAPHS IN THIS POSTER-LIKE MANNER

BLACK, WHITE, AND GRAY HAVE MANY POSSIBILITIES

Compare this sheet of drawings with the next, noting value adjustments



QUICK STUDIES MADE DIRECTLY ON TRACING PAPER PLACED OVER PHOTOGRAPH

IT IS HELPFUL TO TRY MANY SIMPLE ARRANGEMENTS OF THE VALUES

THESE WERE SKETCHED FROM THE PHOTOGRAPH ON THE PREVIOUS PLATE

See how the values of light and dark have been recomposed

to the more central structures below. The subject is still somewhat cluttered and could doubtless be improved by discriminate omission and simplification. The sketch is purposely quite photographic; like the previous ones, it would normally be handled with more dash and vigor.

INDICATION Try to learn to indicate or suggest, especially when it comes to details which would demand too much time and trouble if treated photographically. Note, for example, the tile work on the roofs in Plate 33.

SIMPLIFICATION Simplicity is a virtue. Always remember that one need by no means picture every tone which a subject reveals. The eye is satisfied even by poster-like treatments such as those at the head of Plate 34, where black ink represents all dark values and white paper all that are light. To a less extent, most subjects are thus simplified and conventionalized in pictorial representations. Figures 4 and 5 illustrate the transition between the black and white effects just seen and typical wash drawings. In them gray was used to supplement the black and white. The student would learn much from making a few drawings of these types.

As further exemplification of what we might call artistic license, with emphasis on recomposition of values with simplicity in mind, let us turn to the photograph and drawing at the bottom of Plate 34, as well as to the drawings of the same subject on Plate 35. This photograph, as it stands, has little to condemn it; therefore, in the vignetted sketch at the right the existing values were not greatly changed. The leading alteration was in the foreground where a dark area was added, mainly to illustrate again that the artist is free to take such liberties whenever he so wishes.

TRIAL STUDIES Even when the student realizes that he has this license, he often fails to know how to exercise it. This he can learn only by experience. He must experiment.

The drawings on Plate 35 not only show to what extent one can vary his interpretation of a subject by means of value adjustment alone (without altering its proportions or general character), but they introduce a method of experimentation which can be highly recommended when one has doubt as to what adjustments to make. For these were done very quickly (in brush) on tracing paper placed over the photograph pictured on the previous plate. While such tracing paper sketches buckle considerably, they do very well as preliminaries to help one to decide on a plan of action for a final drawing. One can of course substitute charcoal, pencil, or crayon for the wash and ink.

THUMB-NAIL SKETCHES The student is strongly advised to make some sort of preliminary sketch for every painting done from photograph, at least for a while. Many artists prefer to do preliminaries smaller than their photographs. Often these are only an inch or so in size and are therefore known as "thumb-nail" sketches. Size matters little, however. The principal thing is to get the habit of making them so as to have a definite plan every time work is started on the final paper.

EXERCISE 42 Do not turn to our next chapter until you have painted from a variety of photographs, endeavoring to apply some of the principles here discussed. In part of your paintings, substitute, for the neutral tones of the photograph, colors of your own choosing. If you have no teacher, try to get criticism of your work from other qualified persons.

CHAPTER XV

VITAL HELP FROM OTHER ARTISTS

HOW TO GAIN FROM PAINTINGS PAST AND PRESENT

As an introduction to work in water color painting from original subjects, one can learn much from studying, and even from copying, examples by other artists. Such practice is of particular help to the student unable to join painting classes or to see painters at work. If originals are available they are far better to study than are reproductions, not only for their more intimate appeal, but because their larger size reveals such details as the quality of the paper and type of brush strokes. When reproductions are the only things available, those that show the technique the most clearly are the most useful; this the author had in mind in making his selections for this chapter.

Probably it is unnecessary to caution the reader against persistence in copy work for too long; its purpose is only to give him something of a foundation for the far more vital original exercises to follow. Some educators are strong in their denouncement of *any* copy work, yet it is safe to say that almost every artist has, at one time or another, done some copying, and to advantage.

SUGGESTIONS Select a suitable subject. Make your copy as near as you can to the original size—not the reproduction size. Don't work too small. You can save time by choosing two subjects to carry along together, painting on one while the other is drying. This alternation of attention will also tend towards greater accuracy. Obviously, if your paper is like that used for the originals, your problem will be somewhat simplified.

PAINTINGS IN OTHER MEDIA As no two media can be expected to produce like results, attempts to copy reproductions of originals done in media other than water color are quite certain to prove disappointing, unless one is satisfied with a very free interpretation.

ADVANCING THE WORK The process of copying a color subject in color is in most respects so much like that of making a wash drawing from a photograph that it seems unnecessary to offer many instructions. The placing of the subject, the blocking out of proportions, and the analysis are practically the same. In the construction, and the brush work to follow, don't strive for a slavish copy. Even the artist who made the original could not get *exactly* the same effect again, for in the free type of painting which we have in mind there is always an accidental quality hard to duplicate. But come as close to both the proportions and the colors as you reasonably can; above all seek to catch the same spirit.

Analysis usually reveals traces of a foundation tone covering a large part of the paper, or at least all of it but the sky. Many artists apply a preliminary tint of pale yellow. Such a wash tends to improve the paper and to harmonize the colors which are later laid over it. Diluted Naples yellow, yellow ochre, or cadmium orange will do; much depends on the intended color scheme.

With this dry, the whole is worked up gradually. Match area after area to your best ability, following the scheme originally used so far as you can decipher it. Remember that in discussing the laws of simultaneous contrast we saw that colors vary in appearance according to their proximity to other colors, not always being what they appear to be. This sometimes makes it difficult to judge individual hues. Here is another chance to employ a little finder to detach each one from the rest for better examination. In matching colors, your pigment acquaintance charts and sheets of minglings should prove useful.

If you follow the customary scheme of laying your light tints first, then darker and darker colors, and finally the accents, there may come, no matter how careful you have been, a time of discouragement. This will probably occur when your copy is about half completed, for no copy appears much like the original until the dark areas and finishing touches are in place. You must simply have faith that it will turn out all right, and

throughout is good; note the balance of the individual hues. Observe, as a detail, the white figures in the archways.

STUDIES When one has copied a number of sketchy drawings, it might prove advantageous for him to try to duplicate one or two painstakingly finished studies. That by Hughson Hawley, Plate 42, exemplifies what we have in mind. Unfortunately, it was necessary to reduce this considerably, yet one is able to grasp to fair advantage the processes followed. Transparent colors were used for the most part, though gouache was turned to for highlights and some special effects. The color scheme is rich and pleasing. Textures have been handled with rare skill. There is an elusiveness of detail which adds charm. The employment of graded tones is another thing to be noted; see the towers. Observe in particular how the pointed features have been allowed to die out against the sky to prevent them from appearing too prominent. The sky was mingled (see Chapter XXIII). We should not overlook the treatment of the street with its many figures.

In all these examples, as in the last chapter, we have given our main emphasis to the treatment of buildings and their surroundings. If one is interested in some other type of subject he will naturally select his specimens to copy accordingly. The greater his catholicity of taste the greater his profit. The principle and general method would be the same.

THE WORKS OF EARLY PAINTERS One is not taking full advantage of the work of other artists until he familiarizes himself to a reasonable extent with the history of water color painting. There are many books available which touch on this phase of the subject, among which are two English volumes, *The Art of Water Colour Painting* by E. Barnard Lintott, and *Water Colour Painting* by Alfred W. Rich. Each of these affords complete instruction in the use of this medium (particularly as it is employed in the treatment of landscapes) and describes, with pictorial illustrations, the work of such pioneers as Thomas Girtin, J. M. W. Turner, David Cox, John Sell Cotman, John Robert Cozens, and Paul Sandby. It also deals with many other painters, past and present. One should supplement such reading by attending exhibitions of water color work.

EXERCISES The text suggestions above are so definite that numbered exercises seem superfluous. But don't neglect this work!

"A VIRGINIA FARMYARD"—WATER COLOR SKETCH BY LOUIS W. BALLOU

The subject is simple, the color fresh and well-distributed, and the handling direct

DINAN, FRANCE—A WATER COLOR SKETCH BY JOHN N. RICHARDS

With rare economy of means a full and satisfying expression has been obtained. Original, 13" x 19"

OLD CHANTRY CHAPEL, DURHAM, ENGLAND, AS SKETCHED BY WENDELL P. LAWSON

Here a limited palette has been made to give a pleasing and colorful effect. Original, 9½" x 10¼"

A WATER COLOR OF THE TOWN HALL, STOCKHOLM, SWEDEN, BY EDGAR I. WILLIAMS

This study is vigorous and convincing, the splendid impression resulting from relatively simple means. Original, 10¼" x 14"

THE BOAT BUILDERS—POINT MAGU, CALIFORNIA, FROM A WATER COLOR SKETCH BY MILLARD O. SHEETS

Only rarely do we find such spontaneity and freshness, coupled with judicious adjustment of color. Original, 13¾" x 10⅜"

ROMAINMOTIER, FRANCE—WATER COLOR BY G. EVANS MITCHELL

Here the main elements of the subject were analysed swiftly and transferred to the paper with vigor and sureness. Original, 15" x 10½"

GHENT CATHEDRAL, BELGIUM—A STUDY BY HUGHSON HAWLEY

An embarrassing multiplicity of objects has here been reduced to an orderly and restrained composition. Original, 24" x 36"

BY ARDIS W. HUGHES *Original, 13½" x 19¾"*

BY FRED W. PRELLE *Original, 13¾" x 18"*

STUDENT STUDIES IN WATER COLOR FROM PRATT INSTITUTE, WILLIAM STARKWEATHER, INSTRUCTOR

Subject matter of this type can offer no end of valuable problems

CHAPTER XVI

ON ALTERATIONS AND CORRECTIONS

USEFUL EXPEDIENTS THE STUDENT NEEDS TO KNOW

Perhaps this is as good a point as any to pause for a word on alterations and repairs. If we had the skill to apply Hughson Hawley's rule, "Put the right color in the right place and success is assured," plus the will to leave well enough alone, this chapter would be unnecessary. But to err is human and to change his mind the prerogative of the artist, so it is seldom indeed that a drawing is carried to completion with no corrections or changes.

We emphasize this matter just now because beginners, discouraged by slight troubles which develop, often foolishly discard sketches which still have excellent possibilities. Sometimes the only fault is a defective wash or an inharmonious color, which one with knowledge of corrective measures could shortly cure. One should never admit he is licked until he has tried everything on his drawing which offers the slightest hope of success.

SCRUBBING What we have previously said about scrubbing should be enough to make clear that it is an expedient which one can always fall back upon. Until the surface of his paper is destroyed his drawing is never absolutely hopeless. If its faults do not yield to less drastic treatment, it can be taken to the sink or tub and scoured until practically white again. Soap is sometimes brought into play.

Even when such wholesale scrubbing is unnecessary, there are times when it is helpful to scrub portions of a drawing more or less. This demands real skill, for one must confine the moisture to the offending areas. Usually alternate wetting (with rag, sponge, or brush) and blotting is all that is required. Sometimes a bristle brush (Figure 14) is needed to start obstinate colors. The sponge is especially handy in cases where a mere dabbing at a tone will lift just enough pigment. Repeated application of a moist blotter is another remedy. Only clean water should be used for all such work, and the pigment loosened should be blotted up before it sets again to stain the paper.

SANDPAPER If a drawing is dry, sandpapering can often be done effectively in place of scrubbing, though only good paper will stand so drastic a treatment. Sandpapering tends to alter the surface more than does scrubbing. It is at it best, perhaps, in lightening over-dark areas which might be muddied by scrubbing. Or, if scrubbing has been attempted with disastrous results, fine sandpaper can be turned to as a last resort. It forms a deposit of dust (which must be brushed away or removed with the kneaded eraser), and on some papers causes a gloss; this can usually be overcome by an application of plain water, which, if there is danger of disturbing the pigment particles, can be sprayed on.

The student should experiment on old drawings with both scrubbing and sandpapering. We have already spoken of the two as affording means for creating pleasing textures; see Plates 21 and 27 with their description.

THE ERASER Though erasers have many uses, they are at their best, perhaps, for slightly lightening large areas. Soft ones will do for this. Hard ones, well pointed, can be employed for forming highlights. Scrubbed highlights are likely to be cleaner cut, however, unless the erasing is done with the aid of the shield. Surfaces should not be erased while damp.

Study Figure 52 for results of trials.

THE KNIFE AND RAZOR Examination of original water color paintings in museums and galleries shows that even recognized masters sometimes resort to the knife for the removal of unwanted pigment. Large areas are often scraped or scratched. Highlights are occasionally carved from the paper. A word of caution, however: our experiments in Chapter XIII showed us that if paper is scratched at all deeply, and washes are subsequently run over the scratches, the pigment is inclined to settle into them to form dark spots. Unless such effects are desired, scratching should therefore be the last thing done.

ALTERATIONS BY ADDITION Though nearly every corrective process involves pig-

ment removal, we have exceptions, for there are sometimes light places which need to be darkened. An otherwise satisfactory wash, for instance, may show a disfiguring light spot. While we can give no curative method adaptable to all conditions, if the spot is large it is often best to dampen it first, together with a bit of the adjoining surface, the board being placed flat. There should be no puddle. Then the brush, bearing a moderate amount of the needed pigment, and not too wet, can be touched to this moist surface here and there, allowing a bit of color to spread over the area. Let the spot dry and repeat if necessary.

A small light spot can be successfully darkened by means of stipple. One simply applies many separate tiny dots of pigment so closely if carefully dampened, an inch or so at a time, with a finely pointed brush (care being taken not to moisten the adjacent surfaces).

Many washes either overlap or fall short of the proper boundary lines. The overlapping portions will generally yield to alternate dampening and blotting, while the lights can be filled in with tiny washes or by stippling.

PATCHING Whereas the pasting on of paper patches to hide defects, later rendering them, is not a thing done commonly in typical water color work, it now and then proves necessary in advertising drawing, architectural rendering, and other forms of commercial painting. A patch should be of paper like that used for the drawing, and of proper size. Its edges, when possible, are made to coincide

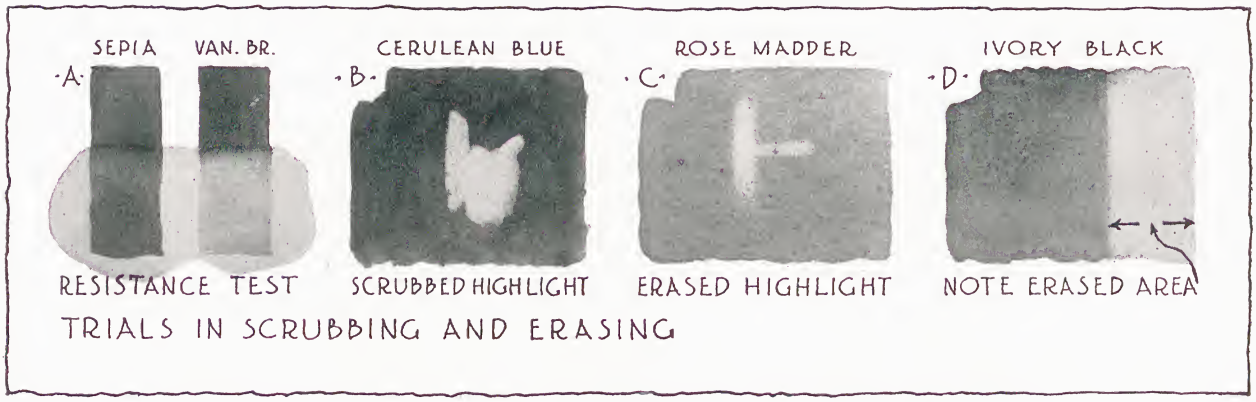


FIGURE 52

that from a little distance they appear to merge to form an even, continuous tone. Sometimes these dots, if conspicuous, can be blended by going over them with a soft moist brush.

REPAIRING FANS In certain types of quick work, fans or runbacks are not considered blemishes—see Vernon Howe Bailey's painting, Plate 49—yet where perfection of wash is desired they can prove most troublesome. To overcome them some pigment must usually be removed and some added. One must go about this patiently. Occasionally it is best to wash off the entire area involved, fan and all. Again it is better to touch up the faulty spot, carefully lightening the dark parts (the brush, together with the blotter, is generally the best for this), afterwards darkening where necessary with wash or stipple. One must experiment; the encouraging thing is that most blemishes yield to perseverance.

MENDING EDGES Wash edges cause as much difficulty as any one thing. Many dry out to be wiry as at 1, Plate 2. Such edges can usually be softened and blotted away with existing lines on the drawing, which helps to make it inconspicuous. To increase this illusion, the edges are usually sandpapered on the under side to a thinness that eliminates shadows. The patch is then moistened thoroughly and glued in place. Unless patches are very small, it is difficult to apply them successfully to any but mounted paper. The larger a patch, the more it may increase in size when dampened for application.

OPAQUE COLOR Chinese white or other opaque water color is occasionally used to paint out or soften undesirable passages.

BURNISHING Though less a matter of repair than of preparation, we take this opportunity to point out that occasionally one smooths a limited area of rough paper with a burnisher to meet some special need. This can be done effectively with a knife handle, a key, or other smooth, firm instrument. One simply vigorously rubs the surface. In painting figures, the artist can employ this expedient where faces or hands are involved; it enables him to work up as much detail as he wishes.

CHAPTER XVII

STILL LIFE IN WASH AND IN COLOR

COMPLETE INSTRUCTIONS AND ANALYSIS OF EXAMPLES

At last we have reached the point where the student, for the first time, is really on his own. No copying now; no secondhand interpretations. Instead, an actual beginning in representative painting.

First, a paragraph in favor of object painting, for there are always some who, impatient to get at other subjects—landscapes, buildings, etc.—scorn the more humble things. Particularly are architectural students inclined to turn up their noses when it is suggested they paint books, cardboard boxes, dishes, and the like. They forget that buildings are similar in form, color, and texture to these objects which, because of their greater simplicity and smaller size, lie more nearly within their capacity. We can safely say that if any student, whether of art or of architecture, will develop fair skill in still-life painting, he will have taken a longer step than he realizes towards the treatment of more difficult subjects.

PLASTER CASTS VS. OBJECTS If the architectural student prefers to substitute plaster casts of some real significance for colorless objects such as we recommend for the first exercises (Plate 43) there can be no harm. They afford good training for anyone, although, being colorless, they are of maximum value only during a limited period of progress.

EQUIPMENT As one customarily gives quite a bit of time to still-life painting, it pays him to provide a convenient working space and suitable equipment. Figure 53 shows an ideal set-up. Note the relative positions of chair, object stand, and drawing table. For wash work the latter would be adjusted to bring the paper to a position almost horizontal. Incidentally, an ordinary table could be substituted for this type.

LIGHTING A single source of illumination is better than two or more, for simplicity of light, shade, and shadow is desirable. The arrangement shown in our diagram permits splendid control; usually the lower shade would be raised approximately to the meeting rails. When possible the light should fall from the left, as here. This prevents the hand and brush from casting annoying shadows. North light is the best; being largely reflected from the sky it is purer in hue and more uniform than other light. Direct sunlight is particularly disturbing. Not only is it dazzling, confusing one's sense of tone and color, but it constantly changes in direction and intensity, causing both subject and painting to vary in appearance from moment to moment.

ARTIFICIAL LIGHT This should approximate natural light in quality and direction. At *E,* Figure 53, is shown an adjustable electric light of telescopic design, permitting extension at any angle. This is practical, as is any common light if provided with an extension cord. Unless some sort of "corrected" lamp, with filters, is employed (see Figure 21, page 11), the bulb should be of the "daylight" type. Such bulbs are available everywhere and can be used in standard sockets. One can judge his colors far better by them than by ordinary bulbs.

OBJECT REST OR SHADOW BOX If an object is to be seen to best advantage, a suitable background or setting must be provided.

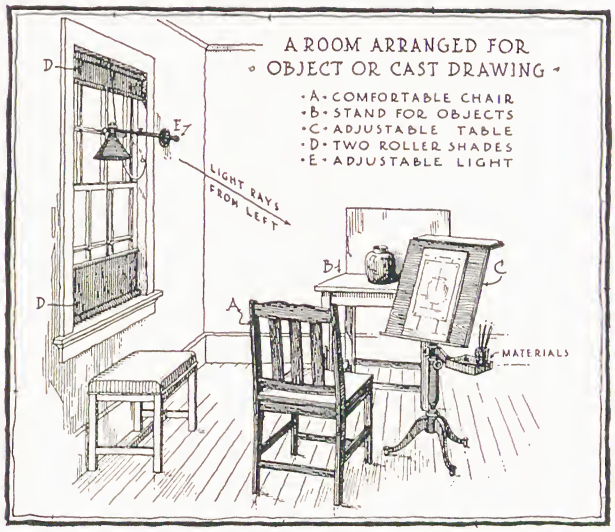


FIGURE 53

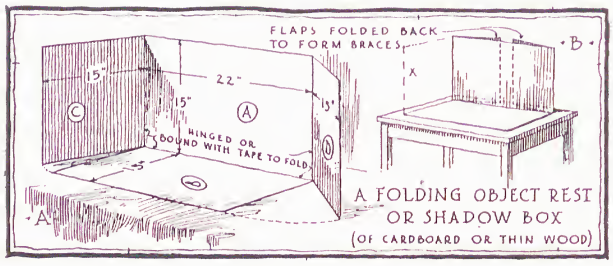


FIGURE 54

Figure 54 shows two convenient types of "object rests" or "shadow boxes." Cloth or colored paper can be thrown across or placed against such devices to provide the desirable color; see how fabrics were used in this manner, Plate 43. For a cast, gray or black affords the ideal background, or a color not vivid enough to detract from it.

EXERCISE 43: WHITE OR NEUTRAL OBJECTS Select a simple object with little or no color (Sketch 1, Plate 44). One with flat planes offers the most definite contrasts in light and shade and so is easiest to do. Place it on your object rest against a simple background—white or gray is suitable. Turn both object and background until pleasing variety of light, shade, and shadow is obtained. If there is confusion of shadow try to simplify it, experimenting with your window shades.

Now block out the proportions lightly in pencil, placing your subject well on the sheet. Don't include too much background. Set the drawing beside the object from time to time for comparison, correcting until reasonably accurate. Remember when seated always to hold exactly the same position, for the slightest shift gives a subject a changed appearance; in this particular, objects are more difficult than photographs.

Before "shading," analyse your subject. Which area or areas seem the lightest? Which the darkest? Note the relative differences between those which lie between. Do some grade from light to dark or vice versa? If your object is of uniform local tone (as when every part is made of the same material), like the box at 1, Plate 44, try to realize that the only reason why some parts look darker than others is because they receive less light.

AN INTERESTING EXPERIMENT In this connection, hold up a sheet of white cardboard and turn it gradually to catch the light at different angles. The more directly it faces the source of illumination the lighter it will appear. A few minutes' experimentation will demonstrate to what extent even the simplest surfaces vary in value according to lighting.

REFLECTED LIGHT Now hold this same card to the right of the object (assuming the light is from the left) and, shifting it into different positions, use it as a reflector to throw light onto the object. You will discover that you can thus change the light, shade, and shadow tones to an astonishing degree. Similarly, you can even illuminate the dark corner of a room appreciably by reflecting light into it by means of a large sheet of cardboard or a white cloth. If you can place your reflector in sunshine, such results will be more striking. All of which adds to our proof that the appearance of things varies according to the amount and direction of both their direct and their indirect (reflected) illumination.

As you analyse your subject (without using a reflector) you will doubtless discover evidences of indirect illumination reflected from the object's background or setting. In Sketch 1, Plate 44, the plane at *b* is lighter than at *a* because of light reflected from the vertical surface of the object rest.

FINDER One of the best ways of observing correctly the values of the various surfaces of any subject is by peeking at them, individually, with one eye closed, through a small hole in a sheet of white paper or cardboard, so held as to be well lighted. If you thus study each value in turn, comparing it with the white of the finder, you will learn what you must do with your pigments. Black and neutral gray finders are useful, also. Too much of this experimenting can hardly be done, particularly as you paint, for your main object just now is to familiarize yourself thoroughly with natural values of light and dark. Finders are particularly helpful in that, by permitting you to view a single limited area at a time, they overcome the confusing effects often caused by simultaneous contrast.

QUALITY OF EDGE Planes of light and shade (or color) in nature are seldom bounded by definite lines; we find no true "outline." (Occasionally we see what seem to be outlines, both light and dark, but these are only narrow areas of tone, such as those representing the thickness of the cardboard of the box in Sketches 1 and 2, Plate 44.) We observe the difference between one plane and another because of dissimilarity of value or hue. Sometimes the line of contrast between two planes seems sharp, as at *a*, Sketch 2; again,

it is soft as at *D* and *E*, Sketch 5. Shadow edges vary, too; note the change from *A* to *B*, Sketch 2. You must learn to observe and render all such edges with care, whether light or dark, distinct or blurred.

TRIAL SKETCH As an aid in your analysis of values and edges, a trial sketch such as was described on page 100 is extremely helpful.

THE FINAL For your brushwork on the final, select a neutral pigment in order to match the values of your object as accurately as possible. Lampblack was used for the sketches on Plate 44. Ivory black is satisfactory. Proceed as your subject suggests, using the same methods as for work from the photograph. Make up your mind what you intend to do with a given area and then do it, directly, superposing as little as possible. Save the darkest tones for last. Get away from your work now and then for a moment's rest. Set your drawing near the object occasionally for comparison. Use your finder frequently.

In making Sketch 1, the end *E* was the lightest area visible and so was represented by the pure white of the paper. The darkest tone was beneath the box at *A*, although the value *F* was almost as deep. Several of the edges, including that at *G*, were extremely light. Practically all the planes showed gradation of tone. The shadow which the box cast on the table was very dark and definite at *B*, but was almost lost at *C* through reflection of light. A second shadow showed quite definitely at *D*; this grew light at *H* on the vertical plane. Though the line *e*, marking the division between box and cover, was fairly prominent for its whole length, its near end was sacrificed in the drawing in order to emphasize the light flap in front of it.

Sketch 2 is much like 1. We have seen how the shadow grades from *A* to *B*. The "table line" at *C* has been kept rather inconspicuous in order to hold it back where it belongs. Note the gradation of tone from edge *a* to *b*. Observe how sharp the shadow edge is at *c* and how soft, through diffusion, at *d*. The back inside corner of the box has practically disappeared.

Sketch 3 shows interesting reflected lights which have crept into the shadow tone at *A*. Note how inside corner *e* has been sacrificed to express depth and detachment. The cover top was drawn lighter than it looks here.

Sketch 4 illustrates a somewhat different condition, for the old book had a bit of color, including the dark touches shown. Note the gradation of tone on the backbone; it grades to a deep value at *A* and then lightens, because of reflection from the table, at *B*.

Reflected light is again conspicuous in the paper bag, Sketch 5. Perhaps the darkest value is at *A*, which marks the division between light and shade; at *B* the tone, due to reflection, has much less strength. The shadow beneath the bag is very dark; see how this lightens at *C*.

EXERCISE 44: OUTDOOR OBJECTS When you have made a half-dozen satisfactory sketches somewhat similar to these, try one of a white or neutral object in sunshine. This helps to acquaint you with the vitality of outdoor light. An object in bright sunshine, like that in Sketch 6, usually has definite shadow edges, for there is little diffraction. If an object is removed some distance from the surface receiving its shadow, however, the shadow edges will be proportionately softer. Sunlight is so extremely brilliant that the shadows, because of simultaneous contrast, seem relatively darker than indoors. In the case of the basket, Sketch 6, the shadows appeared very dark (see *A*), including the farther one at *B*. This was somewhat lightened in the sketch, being graded from *C* to *B* to suggest distance. Observe that though the shadow edge, *D*, is clean-cut, edge *e* is almost lost in gloom; this was sacrificed a bit to aid in expressing depth.

EXERCISE 45: ROUNDED OBJECTS Your efforts should by no means be confined to straight line objects; turn, soon, to things which are rounded, working indoors once more. Sketch 1, Plate 45, presents an ideal transitional subject, as it combines curved and flat surfaces. It is interesting to study the gradual change in lighting from Plane 1, which, facing the light directly, was practically white, to Plane 4, relatively much darker. Plane 5 was about the same in value as 2, receiving approximately as much light. Objects like this, showing a succession of planes, teach us that surfaces deepen in tone proportionately as they receive less light. Rounded objects often show this, too.

This object differed from our previous ones in quality of surface, for it was glazed. At the point marked "lightest light" it mirrored a miniature image of the window far brighter than white paper could express. Many minor reflections were evident, too, some of which we have shown. You must look for such re-

flections when drawing smooth objects. While it is neither possible nor necessary to represent every slight variation in tone, the general character must be expressed.

EXERCISE 46: VARIED OBJECTS Though white objects are best for a time, as their values depend on light, shade, and shadow alone, it is helpful to swing gradually to objects of greater contrast of tone. Vary them as to size, shape, texture, placement, etc. Try some outdoors and some in. Sketch groups of objects, also.

EXERCISE 47: COLORED OBJECTS IN WASH Next, substitute colored objects of similar variety. Paint the first few of these in wash, as the interpretation of color in terms of black, gray, and white is always helpful. Sketch 2, Plate 45, presents a typical example. Though crude in finish (don't worry too much about finish at first) it has caught the vital characteristics of the subject, which was shiny and, on the whole, light. The lightest light was at *A* and the darkest dark just above it. Observe the reflected light, particularly evident at *B* and *C*. Comparing this sketch with the previous one, we discover that where here at *C* we have a strong reflection, the corresponding area in the cup showed a "lost" edge. As both objects were glazed, this difference was due to a reflecting surface not far away.

EXERCISE 48: PAINTING IN COLOR At last we are ready to sketch colored objects in full color, producing such examples as we see in Plates 43, 46, and 47. For your first studies, paint single objects against white or light backgrounds; later, group varied objects against harmoniously colored backgrounds.

There are really two different methods of going about still-life painting. Doubtless the most natural one for the beginner is to try to match the color of each area as exactly as he can, and for early work the author is inclined to think this is the right approach (though note the qualifications that follow). We have seen, however, in discussing simultaneous contrast and the like, that colors, like lines and values, present many optical illusions. If you wish to follow this method, therefore, you should peek at each color through a hole in a white card in order to view it by itself, and so judge it correctly. As in the earlier copy work, lay your light washes first, then your middle tones, and finally the darker ones. Set your drawing back near the object frequently for comparison. While you cannot hope to make perfect representations, do as well as you can, giving as much attention to form and texture as to color. You are striving, in this method, to approximate the effect of good color photography.

The other method, employed by most artists, is less photographic, for one makes many adjustments both as to value and hue, these varying somewhat according to point of view or purpose. The results usually show more interplay of color. As a matter of fact the skilled artist *sees* more color than the beginner, who is handicapped both by eyes untrained to perceive colors correctly and a mind filled with faulty impressions. The novice thinks of many objects as being pure white, black, or neutral gray, yet, strictly speaking, almost everything shows at least subtle hints of hue. Bring together the whitest, grayest, and blackest things you can find, to test this point. Again, objects (and this includes backgrounds) are affected by reflected color, just as they are by reflected light. At this very moment the author sees a white bowl (in sunshine) on a green blotter; it has a surprisingly greenish appearance and green paint would be needed to represent it. Particularly are shiny objects affected by reflections.

Even walls and ceilings are customarily modified by colored light reflected from draperies, rugs, furniture, etc. Which introduces another point for, speaking of draperies, window drapes and window shades often stain or dye the light which comes into a room; in other words, light itself is seldom white. Whatever it touches is tinted with its own color. Even in the photographic sort of work described above you should be on the alert for all such modifications. It is not enough to give each area a wash of what you believe to be its local color.

Aside from these factors, we have several others which offer the artist valuable hints. Take the matter of after-images, for instance. If you are painting a bright red vase against a white background, and fix the eye on the vase for a short time, then transferring the gaze to the background, the latter will be tinted for a moment with a pale greenish after-image of the vase. Many artists utilize this definite relationship between such a red and complementary green, actually painting the background green, thus producing a harmony of contrast. Green is frequently used, too, for mixing with or painting over the red in

shadow areas. Not only does it have a satisfactory neutralizing effect, but it usually produces tones of vitality and interest. This is true of complements generally.

There is still another reason for this common practice of using complements or near complements. Returning to the matter of simultaneous contrast, it will be recalled from Chapter X that "colors are influenced in hue by adjacent colors, each tinting its neighbor with its own complement." (This is why the finder is so essential in color matching, as it temporarily defeats these illusions, though if individual colors are matched exactly, a painting of objects will, when finished, reveal much the same illusions as the objects.) The artist knows, for instance, that if he places a gray object against a bright green background, the object will appear slightly reddish. Against blue it will lean towards yellow or orange. If a red object is contrasted with a white background, the background itself will assume a greenish cast. In other words, the laws of simultaneous contrast give him the same cue towards complementary combinations as do after-images.

You needn't worry about a complete understanding of the reasons back of all this: it is enough for you to know that there is a definite relationship between colors and their complements. If an object is of a certain color you are justified in using its complement or near-complement in its shadow, background, or elsewhere; similarly, if you see an almost colorless object against a color, it is not only pleasing, but logical, to give it a faint complementary tint. For that matter, since your principal aim is customarily to make not only a reasonably honest drawing, but a beautiful one, you are at liberty to use any colors you please provided they do not defeat your main purpose. So the prime difference between this method and the one first discussed, is that it allows the artist to become an intelligent interpreter rather than a chromatic camera.

So far as the technical procedure of such work—in fact, any water color work—is concerned, rest assured that many methods are followed. There is no one right way. Some artists build their effects mainly by running washes, with the board rather flat. Some paint very freely, with their paper almost vertical, which, though preventing careful wash work, permits the painting to be seen easily and compared with the subject at all times. In this method less water is used, the pigment being "drawn" and dabbed into place with a brush large enough to convey plenty of pigment to the surface without the danger of having it form in actual puddles and run off. So never be restricted by anything you are told: your work will be judged by results, not method.

OUR COLORED EXAMPLES Plates 43, 46, and 47 reproduce typical student drawings from The School of Fine and Applied Arts, Pratt Institute, Brooklyn, N. Y., James C. Boudreau, Director. The first four were done by first year students in illustration, under the instruction of William Starkweather. The others were by a third year student in advertising design, under Anna S. Fisher, N. A.

The example by Ardis W. Hughes, Plate 43, shows a group of objects sufficiently related to form a logical composition, yet offering splendid variety in size, shape, color, and material. The ornate vase which dominates the group has been extremely well handled. The complex pattern in particular is suggested with rare skill, and stays on the surface where it belongs. This surface is nicely modeled to express curvature; spots of highlight accentuate the form. Though the feeling of roundness results mainly from the gradual change in value, a contributing factor is the skilful blending of hue. Towards the right we see a warm reflection, apparently from the nearby fabric; this is separated from the highlighted section by a cooler tone, the alternation of coolness and warmth giving a very natural and chromatically harmonious expression of both form and color. Throughout the entire subject we observe this same interplay of hue: also a careful attention to texture representation. Greater sacrifice of some of the lighter values, particularly at the lower right, would have resulted in increased restfulness, perhaps, yet on the whole this is an honest and pleasing study, worthy of high commendation.

Fred W. Prelle shows us on this same plate another sincere study of objects. The handling of the copper is particularly convincing. Metals are not easy to do as no pigments match them exactly. Observe here that the varied tones are so arranged as to produce a feeling both of roundness and of soft metallic luster. In the highlights the brilliancy of the reflection has entirely annihilated the copper color, as is usual with polished objects. The composition of this sketch is commendably simple. The red dish is perhaps a bit small for its

foundation position, and the blue-gray foreground tone too retreating in relation to the warm background, but these are minor points.

Our studies on Plate 46 are somewhat more striking in color. That at the top, by Arthur K. Getz, is not only amusing in subject matter but is also nicely composed and spontaneously rendered. The extremely large highlight on the elephant seems a bit too persistent in our reproduction, and his ear (?) is not easily "read," yet it is quite possible these things appeared that way in the object. The duck is especially well presented. The "fan" of yellow, which in some subjects would be considered a defect, actually plays a useful part in the texture interpretation. The metal bowl at the left is capably treated. Observe the manner in which its local color has been modified by reflections from the adjacent objects, including the green fabric beneath; note the way in which the cloth and object practically merge into one. In fact, all edges throughout have been splendidly managed. The background of the entire subject, complementary in its hue, is sensibly suppressed. The general distribution of hue is also satisfactory; the red wheels supporting the duck pleasingly echo the red of the elephant, while the yellows, blues, and greens balance nicely.

Though the fruit of Robert Lathrop's sketch is perhaps more commonplace as subject matter than are the toys above, his composition is particularly fine and his treatment by no means hackneyed. The foreground apples are especially convincing. The plate in the background is pictured with pleasing restraint, and its pattern well suggested. The way in which its left edge becomes almost lost in the background is worthy of note. This dark blue-violet background tone, remarkably perfect in application, is perhaps the most distinctive feature of this rendering. Not only does it throw the objects into strong relief, thus contributing to the decorative character of the whole, but its very simplicity imparts a certain strength and dignity. When one turns from it to some of the other backgrounds in this series, they seem restless and involved by comparison. The student should examine the edges in this subject, for rare discrimination has been employed in their treatment.

The drawings on Plate 47 are both by one student, James Dickison. These introduce us to another thought, for in each instance the objects are all of glass, and placed against the light. As it is no easy trick to render glass thus, this student deserves warm praise.

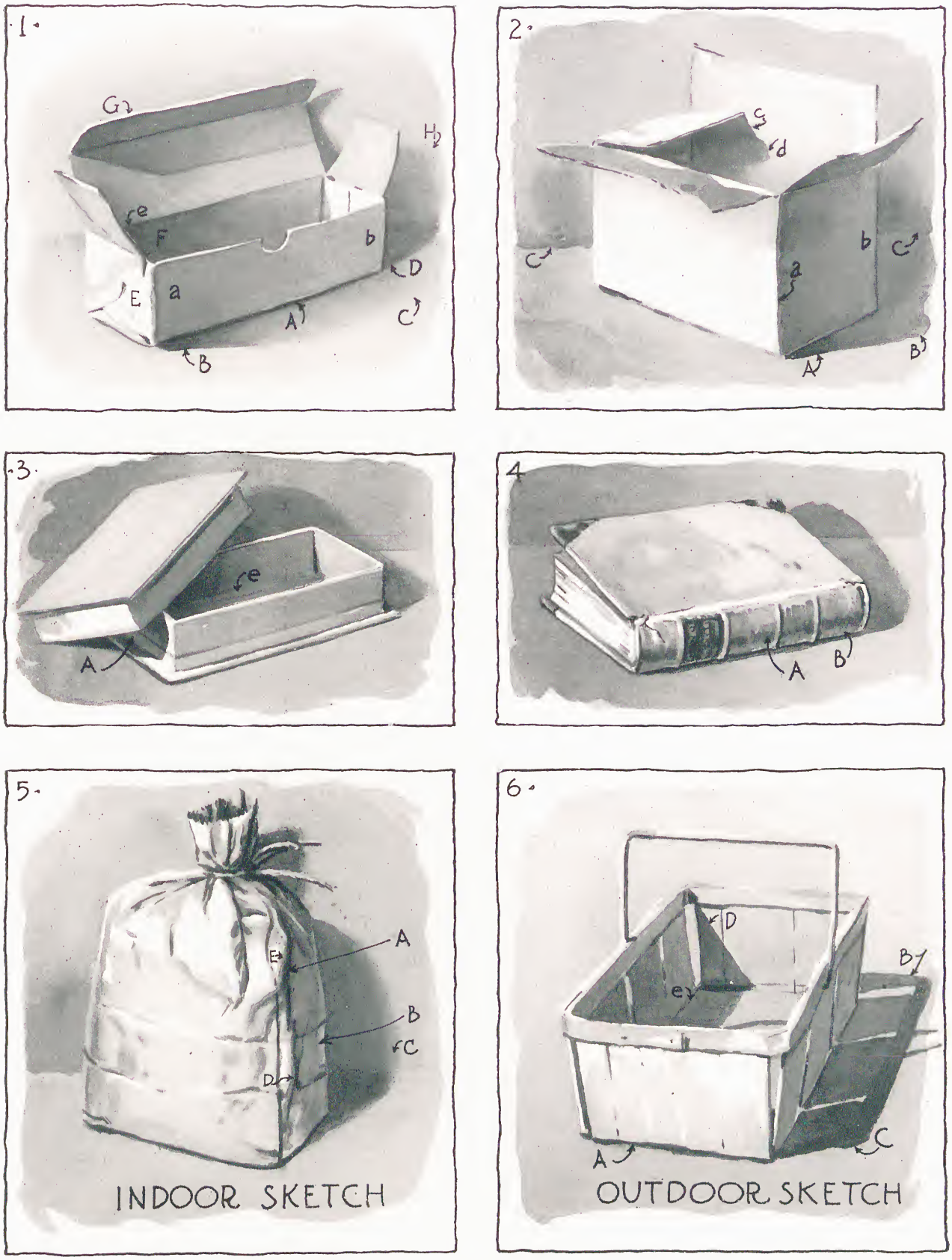
The first study is unusually natural in effect, despite the freedom which its handling evidences. The quality of the glass is everywhere well expressed. The background is nicely done, too, especially the table below. See how the background tones modify the glass in places. Possibly the slanting window bar at the upper left-hand corner is distracting.

The second example leans towards the modern, both in arrangement and treatment. Observe that the support is simply a horizontal plane, showing no perspective; the objects, too, are in what the architect would call "straight elevation." Even in the technique we find something of this same conventional character; note the brush marks of the pitcher. Despite these conventionalities, there is an effect of realism. One knows without doubt that he is looking at a representation of glass; this is a lot more than can be said of some of our contemporaneous work! The smoothness of this glass is nicely caught, also. Surely these are two splendid drawings.

EXERCISE 49: LARGER SUBJECTS When you have made a wide variety of object drawings such as we have shown, experimenting with both artificial and natural light, turn to larger subjects such as pieces of furniture, room corners, and the like. Even sketches of entire rooms, on the nature of those by Vernon Howe Bailey, Plates 175, 176, 177, could be attempted. These subjects are of particular value to the architectural student, putting him in line for the rendering of proposed interiors. The same methods of working apply.

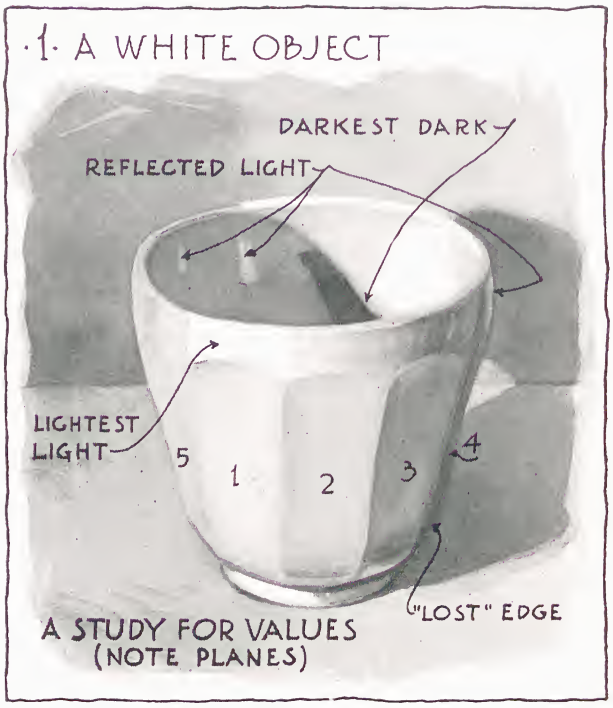
Sketching from simple colored objects outdoors will give you an ideal foundation for your more serious outdoor sketching to follow, such as we discuss in the coming chapter. Sketch 3, Plate 45, shows a subject of the type now in mind. All such things—wheelbarrows, watering pots, pails, tubs, etc.—offer an excellent test of one's skill. Objects above the eye should not be neglected; the architectural student should find old lanterns, candlesticks, etc., interesting—see Sketch 4. The originals of Sketches 3 and 4 were in color.

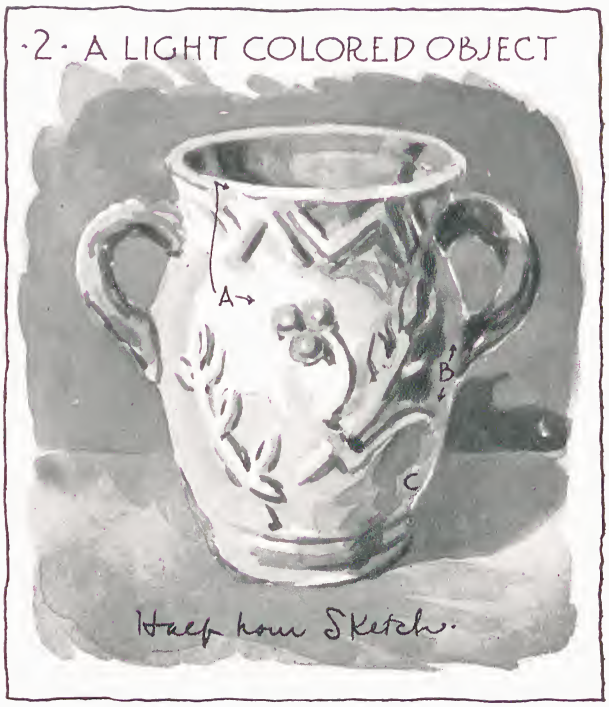
OTHER METHODS In conclusion, we should perhaps point out that many water color drawings of still life are done, not by the direct method we have described, but by the "scrub" method discussed in Chapter XIII. Such work presents a rich, pastel-like effect.

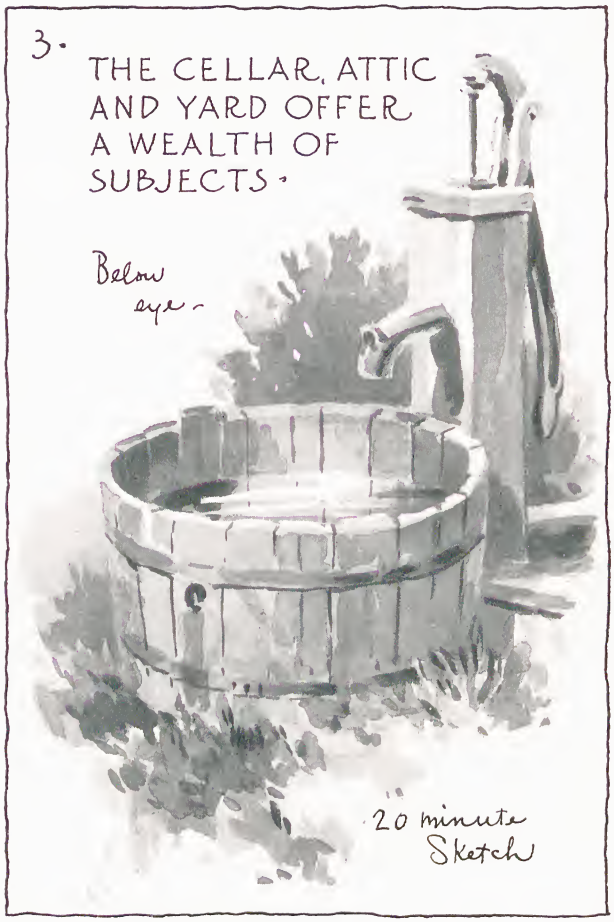


SOME WASH STUDIES DONE FROM ACTUAL OBJECTS

Such work offers valuable preparation for painting in full color







ONE SHOULD TRY A WIDE VARIETY OF SUBJECTS, INDOORS AND OUT

They should vary in size, shape, color, value, texture, and placing

CHAPTER XVIII

AND NOW FOR OUTDOOR SKETCHING

A COMPREHENSIVE DISCUSSION OF THIS VITAL WORK

Outdoor Sketching! Is there ever a time when the artist or student fails to experience a sensation of pleasure at the opportunity of getting out under the open sky to pit his skill against Mother Nature's? Probably not, for outdoor sketching, though serious study, is also a jolly game—a sort of hide-and-seek. Nature, while boldly placing on display an almost inconceivable variety of effects, hides the key to their successful representation, and then taunts puny man, with his imperfect perception and inadequate tools, to find it. Nature always wins in this unequal contest, for even the most gifted individual cannot hope to gain a thousandth part of the thing he seeks. Yet failure ever spurs him to fresh endeavor, for there is "zest in the quest" and joy in one's most meagre accomplishment.

Birch Long at Work, Sketched by J. Scott Williams

And it is pleasure coupled with profit, for not only do outdoor subjects provide one with an excellent means of acquiring speed and accuracy in the representation of line and form, light and shade, color and texture, but they familiarize him with impressions, often subtle, of atmosphere, distance, detachment, movement, etc. These are the things which, properly interpreted, raise one's work above the mediocre, so are well worth going after.

Outdoor sketching commends itself especially to the student with architectural inclinations, for if one is to design, or even represent, *proposed* buildings and their settings, how better can he prepare himself than by drawing *actual* buildings and their surroundings? Even subjects devoid of architectural interest are useful, for they prove an antidote for the T-square and triangle tightness and indirectness of the drafting room and for the false notions of appearances which daily contact with plan and elevation all too often engenders.

IMPEDIMENTA

One needs but few things when he goes "a sketching" but they should be selected with care. The same materials employed indoors are customarily suitable, especially if light and compact. If the color box commonly used is large, we recommend a smaller fitted one. That in Figure 55, in addition to having spaces for the pigments and brushes, contains a cup and water bottle. With the ordinary box, some sort of water container must be provided: a type not easily tipped over is best. One generally dispenses with color saucers and does his mixing directly on

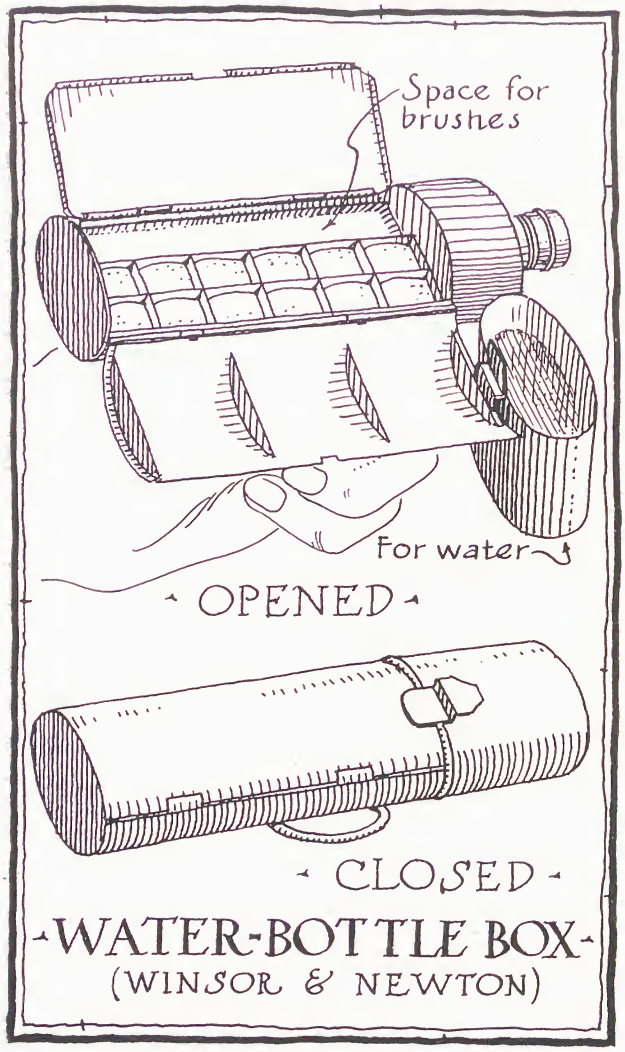


FIGURE 55

his paper, or on the palette which is a part of his box. Brushes can easily enough be slipped into the pocket, though moist hairs should not be allowed to dry in a cramped position. Figure 56 shows a convenient pocket brush, while in Figure 57 we picture a carrying case for ordinary brushes. This latter sketch also portrays a water bottle, with cups which become a part of it when not in use.

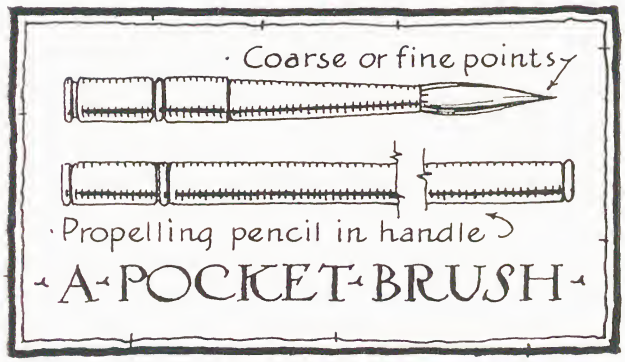


FIGURE 56

As to paper, the sketch block made up of several sheets is employed, in all probability, more than anything else, yet rather for its convenience than its other virtues, for the paper usually buckles badly when moistened and seldom comes flat again. Spiral bound sketch books of heavy unmounted paper are becoming increasingly popular. The author prefers half imperial sheets (15″ x 22″) of mounted board such as Whatman, taking several with him so varied in surface as to offer some choice according to subject. These stay reasonably flat and are easy to handle. Or heavy paper can be stretched (see Chapter IV) on both sides of thin boards—wall board will do—a sketch being made on each surface.

When you start on a sketching trip, check your materials to make sure you have with you, in addition to paints, brushes, and paper, a pencil for layout, an eraser, blotters or rags —in short, everything you think you may need. A wide brimmed hat or an eyeshade sometimes proves desirable, or dark eyeglasses of neutral quality. You may like a stool—see Figure 58. In rare instances umbrellas are employed—see Figure 59. Some like two stools, employing the second as a rest for the paper, though this is more commonly held in the lap.

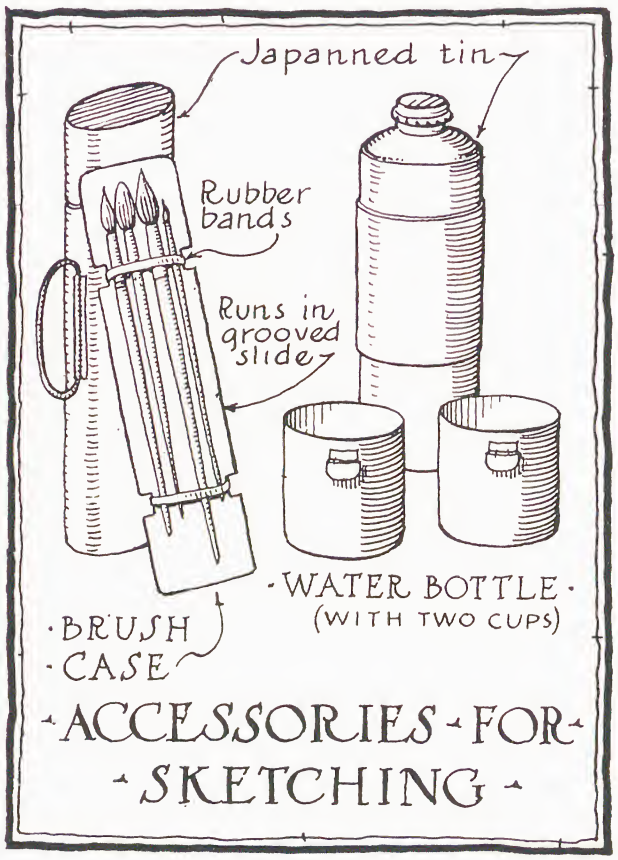


FIGURE 57

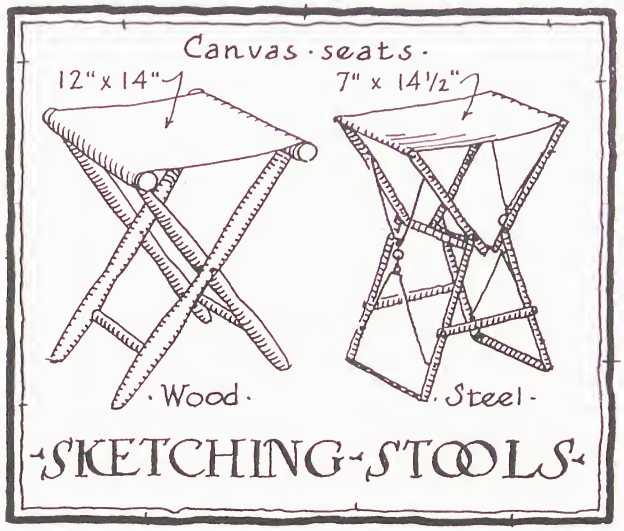


FIGURE 58

Occasionally it is laid on the ground, or is supported between the ankles, almost horizontally, the nearer edge touching the ground.

Easels are not as popular as in oil work. This is mainly because of the difficulty of running washes on an upright plane. We do find water colorists now and then who have developed methods permitting the use of the vertical paper, and they customarily select folding sketching easels light in weight, yet rigid. Some sit and some stand. There is no denying one advantage of this arrangement; it encourages the artist to back away from his work frequently, comparing it with his subject. If one paints with his paper nearly flat he should set it up from time to time and get away from it, to study his results. There are easels which permit using the paper either flat or upright.

The view-finder is a small but important item too often overlooked. The type we now have in mind is that consisting of a white cardboard, post card size or so, pierced with a rectangular aperture, perhaps an inch and a half by two inches in size. In a moment we shall speak of its use.

Another instrument favored by some artists is the diminishing glass, Figure 60. Looking through it, one sees things pulled down to small size, and therefore simplified. Both subject and drawing can be so studied.

SELECTING THE SUBJECT With equipment ready, go to a likely spot and hunt for a suitable subject. It's pleasant to have a congenial companion along. Don't choose your subject too hastily. The view-finder should prove helpful, used much like that of the camera. Hold it upright, sighting through it with one eye closed. Try it at arm's length, and near the eye. Try the opening vertically and horizontally. The finder functions as does the frame of a picture, permitting you to concentrate on a limited area at a time. Its value cannot be overemphasized.

Simple subjects are best: too many elements are bound to prove confusing. Interesting sketches can be made from commonplace things. They need not be beautiful, but should have character. When it comes to buildings, dilapidated or humble ones do very nicely. Try to choose something which composes well (makes a good picture) practically

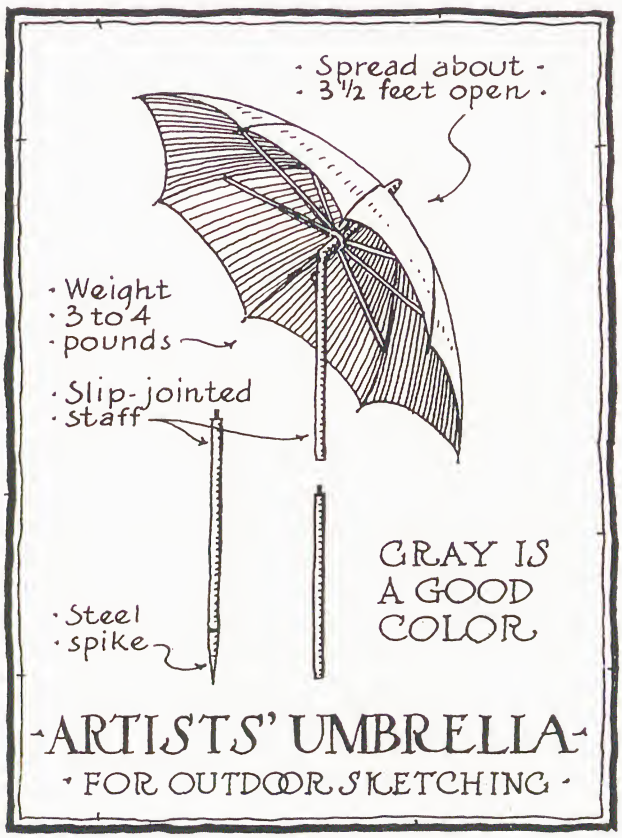


FIGURE 59

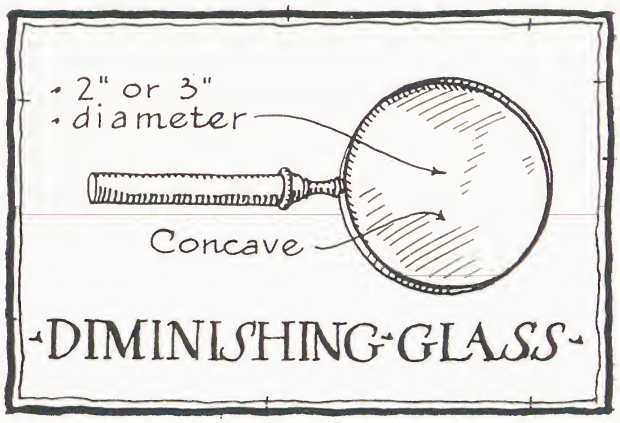


FIGURE 60

as it stands, though the artist always feels free to recompose to any reasonable extent.

POINT OF VIEW It is important to sketch any subject from the best angle. Walk around it, if possible, studying it through your finder from various positions until you discover the ideal "point of view" or "station point." If you can, sketch it from here. Don't get too close to your subject for if you do you may lose its larger impression because of its bewildering intricacy of detail. And if it is extensive, and you are too near, you will be forced to shift the eye from part to part as you work, which may cause the development in your sketch of perspective distortion. Or it may become a composite sort of thing, lacking unity. You will find it easier, also, to judge colors and values when a subject is at some distance. In the case of small things this precaution is less necessary.

LIGHTING There is usually a time of day when any given subject will appear to greatest advantage, particularly so far as the composition of its light, shade, and shadow is concerned. Obviously this is the best time to sketch it. As a rule, appearances are most pleasing under the slanting rays of early morning and late afternoon. Changes in lighting are rapid at such hours, however, which make them more difficult for the beginner than those nearer midday. For your first sketches you will simplify your problem if you pick things which you believe will probably show definite contrasts of light and shade (and color) until your work is complete. As you gain experience you can exercise greater leeway: not only will you learn to recompose all such things according to your needs or mood, but you will develop the ability to hold fleeting impressions in your mind long enough to transfer them to paper.

COMFORT Make yourself as comfortable as you can. Sit or stand with your paper in the shade, for sunshine can be very misleading, and may prove trying to the eyes. Once you have taken your position, hold it until your subject is completely blocked out.

At first you will probably prefer an isolated position, away from spectators. Gradually you will become accustomed to them. If so large a group ever collects that it proves disconcerting, pass your hat, occasionally, with feigned seriousness: this method, which has been tried out by the author and by many of his friends, is guaranteed to disperse it!

ANALYSING THE SUBJECT: CONSTRUCTION Assuming you have a rather realistic interpretation in mind, you will want to block out the masses quite correctly. The pencil is best for this, though with increased experience you can often paint directly, with no previous construction. Before you draw a stroke, study the subject until you have it clearly in mind. Determine where your eye level is, for this corresponds in height with the horizon line on which lie the imaginary vanishing points to which receding parallel horizontal lines appear to converge if sufficiently extended. Sketch this eye level. Determine, also, by means of your finder, the limits of your picture, and "place" the subject on the paper accordingly.

With your subject blocked out, your analytical faculties will be directed to its light, shade, and shadow, and, more particularly, to its color. A minute's contemplation will be enough to convince you that you could not, even if you wished, portray in detail every bit of your subject matter on the limited surface before you and in the short time at your command. Instead, your aim is to imprison something which will convey to the spectator an adequate impression or illusion. It is by no means necessary to match each visible form and value and hue. So, as you analyse, try to understand which of the aspects of the whole really count. As you paint, attempt to interpret these aspects—the spirit of the subject.

To be a bit more specific, if your subject is striking because bathed in sunlight, sunlight is the thing you should strive to suggest. If, instead, you attempt to match every color before you, individually, thinking the sunlight will take care of itself, you will be quite likely, despite every care, to fail to emphasize sufficiently this vital impression. So you must sacrifice little things all the time if you are to express the big things. This takes self-control. If a building is before you, it is the roof and the walls you should represent, and not all the shingles and bricks of which they are composed. Keep this in mind if you can. In this analysis, try to look at your subject as a strange curiosity, never seen before. Examine it in a speculative, critical sort of way. Good sketches result more from discriminating observation than from skilful delineation.

PRELIMINARY SKETCHES As you analyse, it often pays to make a tiny sketch or two, as a means of getting better acquainted.

This not only saves time in the end but is conducive to best results, for, having settled some of the major problems, you can push the final painting ahead all the more rapidly and surely.

RECOMPOSITION Even if you choose your subject with the utmost care, to get the best effect you will doubtless have to use some artistic license, recomposing as you go along. You are not merely a chromatic camera. You will place greater emphasis on some essentials than your subject shows. You will enlarge or decrease some in size. You will rearrange. You will subordinate or omit non-essentials. Things in the distance you will perhaps paint a bit softer than they appear.

CENTER OF INTEREST Remember that as a rule, the artist develops in every sketch a center of interest, or focal point: it is here that the attention concentrates. (See, in this connection, Chapter XIV.) Too often the beginner's work shows scattered interest. This is natural. He looks first at one thing, and paints that. For the moment it is all-important. Then he paints another thing which, in turn, seems vital. Continuing in this way, when the whole is finished these individual parts demand even more attention than in the original subject, as normally viewed. In a painting, the artist, as we have said, should be less concerned with this exact delineation of detail after detail than with the building up of a convincing impression of the whole. By placing his strongest emphasis of value and color on his leading elements, which usually are shown at or near the center of his paper, he builds this center of interest to which he subordinates all else, thus arriving at a satisfying result. Sometimes, to be sure, a sketch has two or more centers of interest, and this is all right providing they are not rivals for attention. One should dominate.

PROCEDURE Everything that we have said about painting from the photograph, objects, etc., relates with equal force to our present problem. The reproductions accompanying the following chapter, as well as those in Chapter XV, reveal the common methods.

Briefly, once you have analysed your subject and made up your mind as to what you should do, do it. Don't treat the matter too seriously. Have some fun! Sail in and get some indication of the main elements on your paper as soon as you can, advancing the work from this foundation. Apply your color in the way which is most natural. Run washes, if washes seem called for. Mingle pigments if this serves your need. Draw with your brush; dab with it. Use the largest brush you can manage. Don't select small paper, for it will force you to work in too pernickety a manner. Stand back every few minutes to view the effect of your painting. Rush up and make your changes or additions quickly, while they are clear in your mind. Don't worry over little run-backs or other minor technical faults. Strive for crispness; a feeling of spontaneity. And, above all, an impression of truth.

COLOR JUDGMENT Don't let preconceived notions as to colors handicap you. Grass, in sunshine, is not usually green-green, but, rather, yellow-green. The sky near the horizon is seldom a deep blue; often it is greenish, pinkish, or yellowish. So don't paint a given thing the color you think it *ought* to be; look and see how it appears in relation to its surroundings, and paint it that way.

COLOR DISTRIBUTION Subjects in nature seldom give us the best distribution of color. It's a fairly safe rule that if you use a color on one area it's a good thing to use it elsewhere, perhaps in reduced area. Many artists, for example, in painting the sky, see that some of the same hue is distributed in other places, as on the window glass. Perhaps the green of the foliage is brought into the shutters of a building. Thus is woven a pattern of color which tends towards chromatic balance. In this connection, see Plate 36 by Louis W. Ballou.

PURPLE SHADOWS The author is often asked if the artist really sees all the purple shadows, etc., which he paints. Of course not! Naturally with his trained eye he sees more color than the layman, but this doesn't wholly explain the matter. Yet he has sound reasons for "all these queer, impossible hues." First, remember he frequently desires to represent dazzling surfaces in bright sunlight. As his pigments and even his whitest papers are dull, compared with actual light, he has to "force" his color, taking advantage of his knowledge of simultaneous contrast: such problems as this account for many of his somewhat artificial hues. So far as truthful impressions are concerned he is actually being more honest, many times, in making these readjustments, than he would be if he matched his subject as well as he could hue by hue, for if he were to do this his final effect would be quite liable to seem dingy. Furthermore, the artist common-

ly tries to make each painting beautiful, so what more natural than for him to work for a harmonious, and perhaps decorative, chromatic arrangement, even to the extent of allowing artistic license to modify true appearances somewhat? Additional uses of strong or "strange" color result from the artist's attempt to hint at such unpaintable things as motion, sounds, and even odors.

Getting back to purple shadows, the reader who has followed our discussions on simultaneous contrast realizes that if one's problem is to catch the impression of bright sunlight, and the yellow and orange pigments customarily used for such a purpose prove inadequate, it is logical to force them to appear all the more brilliant by contrasting them with blues and violets.

So, whether in outdoor sketching or other water color painting, don't hesitate to use *any* color if it helps you to express your subject more adequately and pleasingly.

SQUINTING It is quite common to see an artist squinting at his subject, or at his painting, through partially closed lids. His thought is to reduce the whole to simple terms, shutting from view all but the leading elements, and softening these so as to judge better the main effect. This is often a good practice, as is that of looking at the subject through the reducing glass or, better yet, some other lens or bit of translucent glass which permits one to see only the more evident contrasts.

SHADOW SHAPES It should be remembered that the appearance of a subject depends to a great extent on its light and shade, and that these vary from moment to moment as the sun shifts in position. Shadow shapes change so rapidly that it is generally advisable to outline them all at one time in pencil; then to hold to the proportions as sketched, regardless of any subsequent changes which develop. Or the rendering of all shadows may be postponed until about the last thing, when they may be added hastily.

SHADOW EDGES One must give attention not only to the areas of shades and shadows, and their values, but to their edges. Shadow edges on sunny days are usually sharp, on other days blurred. Effects due to diffraction must be considered: see Chapter XX. Edge treatment sometimes has much to do with the success of a painting.

A COLOR MATCHING TIP When in doubt about the color of an area of a subject, bring it into direct comparison with the white of your finder. Or have with you one of the little books of colored papers such as the school supply houses put out, and hold up some of them for similar comparison.

SPECIAL MATTERS There is little more that we can offer in the way of instruction, for you must learn by doing. It is quite possible, though, that it would pay you to read at this time the coming chapters dealing with such special things as clouds, foliage, water, and details of buildings. One can't hope to master each of these, however, before he goes out to sketch.

Such special mediums as opaque color, colored pencils, tinted papers, etc., are much used for outdoor work: when you think the time is ripe, turn to Chapter XXVII. Of particular interest just now should be the following chapter with its descriptions of a selection of typical outdoor sketches.

INCOMPLETE WORK: NOTES If you are forced to leave a subject before your sketch is finished, and plan to complete it later in the studio, take a good last look before you depart, trying to form definite mental impressions of the uncompleted portions. A snapshot may prove valuable, too. As another help, make a few rapid pencil or fountain pen sketches, bearing descriptive notes. Some artists make many sketches of this sort—mere diagrams accompanied by notes—whenever they run across interesting subjects and have no painting materials with them.

MATTING SKETCHES When one works outdoors he hasn't time, as a rule, to carry his washes exactly to margin lines. More often he takes them to the edges of his paper. In his studio, later, he can decide on the most pleasing proportions for each sketch. In this connection, L-shaped pieces of paper or cardboard such as were pictured in Figure 51, page 90, can prove of help in determining just how much of the entire subject matter is worth retaining. Experimentation often demonstrates that quite a bit of a sketch can be cut away (or hidden by mats) advantageously.

Proper matting can add a hundred per cent. to the appearance of a sketch. Seemingly inferior paintings frequently improve wonderfully when matted. Plain white or ivory mats not less than three or four inches in width all around are usually the best, though much depends on the subject. Sometimes a line or two of color adds to their effectiveness.

BY ARTHUR K. GETZ *Original, 15½" x 11½"*

BY ROBERT LATHROP *Original, 15¾" x 11¾"*

FURTHER STUDENT STUDIES FROM MR. STARKWEATHER'S PRATT INSTITUTE CLASS

Once one has mastered such objects he can paint almost anything

Original, 12¼" x 17¾"

Original, 13½" x 18½"

TWO STUDIES BY JAMES DICKENSON, PRATT STUDENT, DONE UNDER ANNA S. FISHER, N. A., INSTRUCTOR

Here we see in direct comparison two quite different treatments of like subject matter

OLD HOUSE NEAR FREDERICKSBURG, TEXAS—WATER COLOR SKETCH BY SAMUEL E. GIDEON

Simple subjects, complete in themselves, offer the student the easiest starting point. Original, 9¾" x 6½"

THE TRAJAN FORUM, ROME, DONE IN WATER COLOR BY VERNON HOWE BAILEY

This is frankly a sketch, clearly revealing the honesty of purpose behind it. Original, 15" x 20"

EGLISE ST. PIERRE, AVIGNON—WATER COLOR BY CAMILLE ETIENNE GRAPIN

Note the interesting use of black and colored pencils in the construction. Original, 9¼" x 13"

CAMPO SANTA MARIA NUOVA, VENICE—WATER COLOR BY JEAN JACQUES HAFFNER

This masterly treatment is especially notable for its chromatic equilibrium. Original, 24″ x 27″

PLACE DE LA HALLE, SENLIS—WATER COLOR BY SAMUEL CHAMBERLAIN

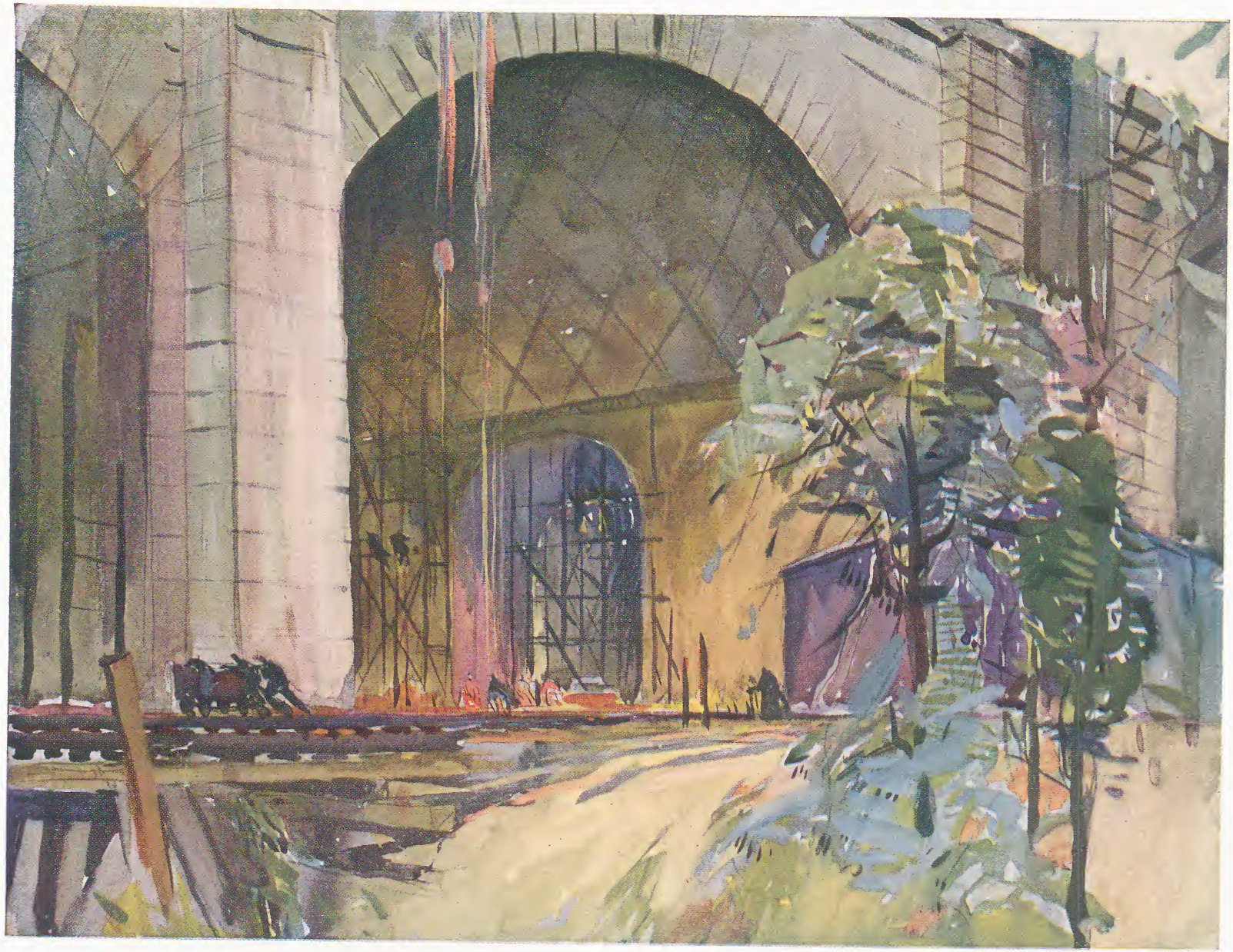
Both hues and values offer strong contrasts, producing a crisp, sparkling result. Original, 13¼" x 19½"

WATER COLOR BY CASS GILBERT, COURTYARD, LEICESTER HOSPITAL, WARWICK

The architect of the Woolworth Building here reveals his skill with the brush. Original, 13¼" x 19½"

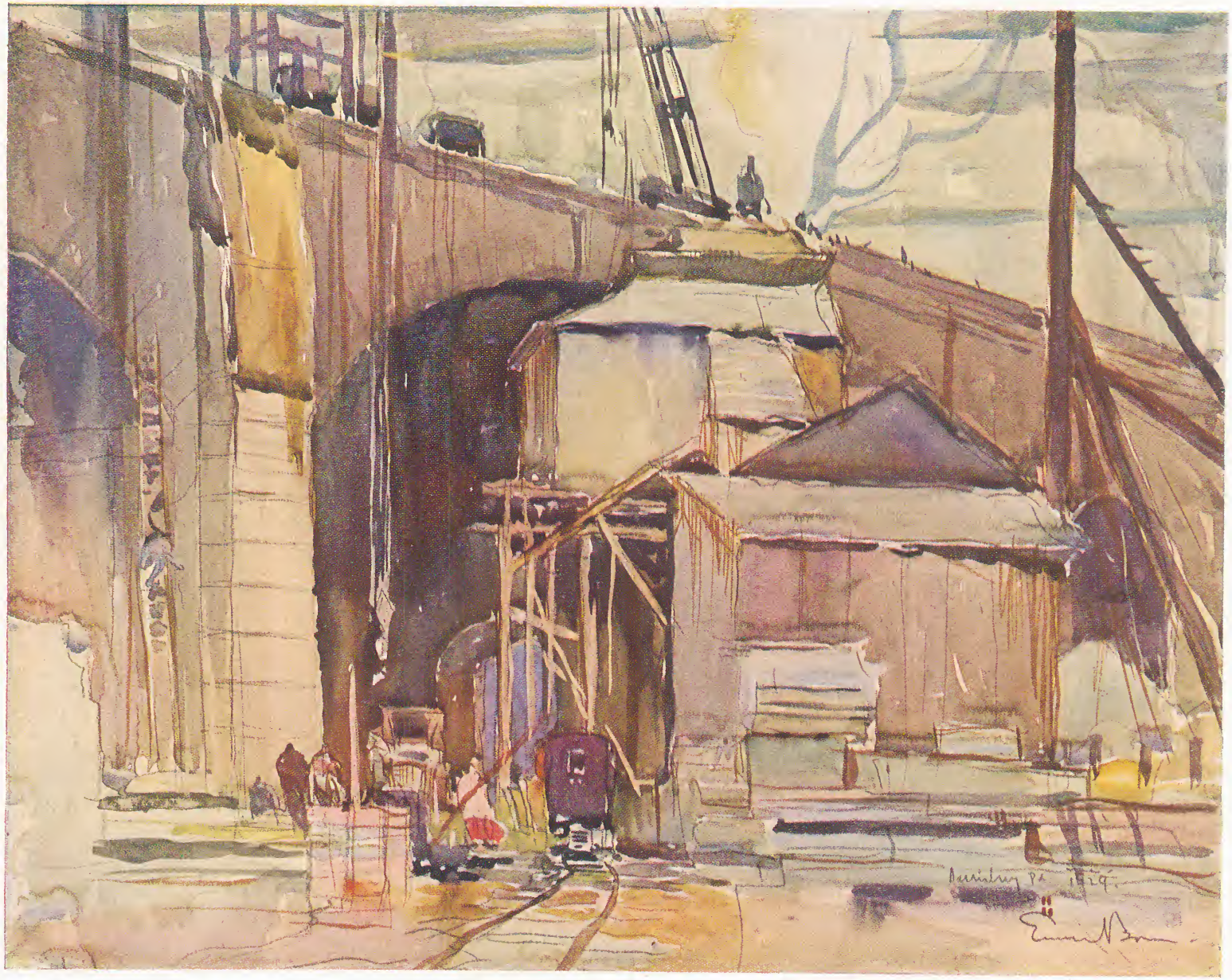
CATHEDRAL CLOISTER, MONREALE—WATER COLOR BY CASS GILBERT

Through subtle suggestion the artist has caught the architecture. Original, 11½" x 18"



SOLDIERS' AND SAILORS' MEMORIAL BRIDGE, HARRISBURG, PA.—SKETCH BY ERNEST BORN

Here are crispness and vigor of handling, yet not without a complementing delicacy. The coloring is rich. Original, 25" x 19"

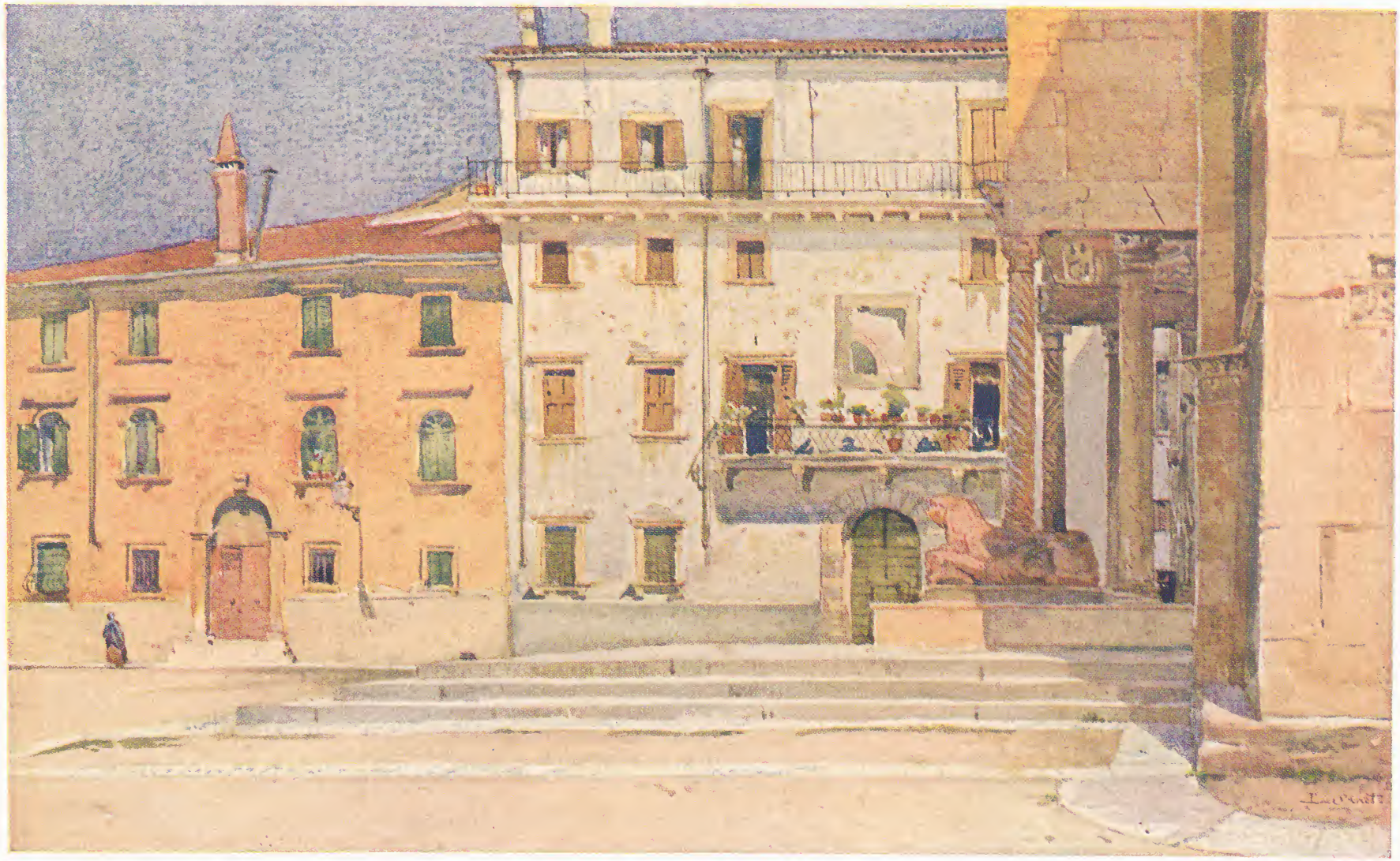


ANOTHER SKETCH BY ERNEST BORN OF THE SOLDIERS' AND SAILORS' MEMORIAL BRIDGE

The brush has been used in a somewhat decorative linear manner for affirmation of form and distribution of interest. Original, 24" x 19"

THE STEEL BRIDGE—WATER COLOR SKETCH BY CHARLES A. BRADBURY

The simple indication of the intricacies of the steel work is highly commendable. Original, 10½" x 13¾"



VERONA—THE PIAZZA OF SAN ZENO AS SKETCHED IN WATER COLOR BY PAUL P. CRET

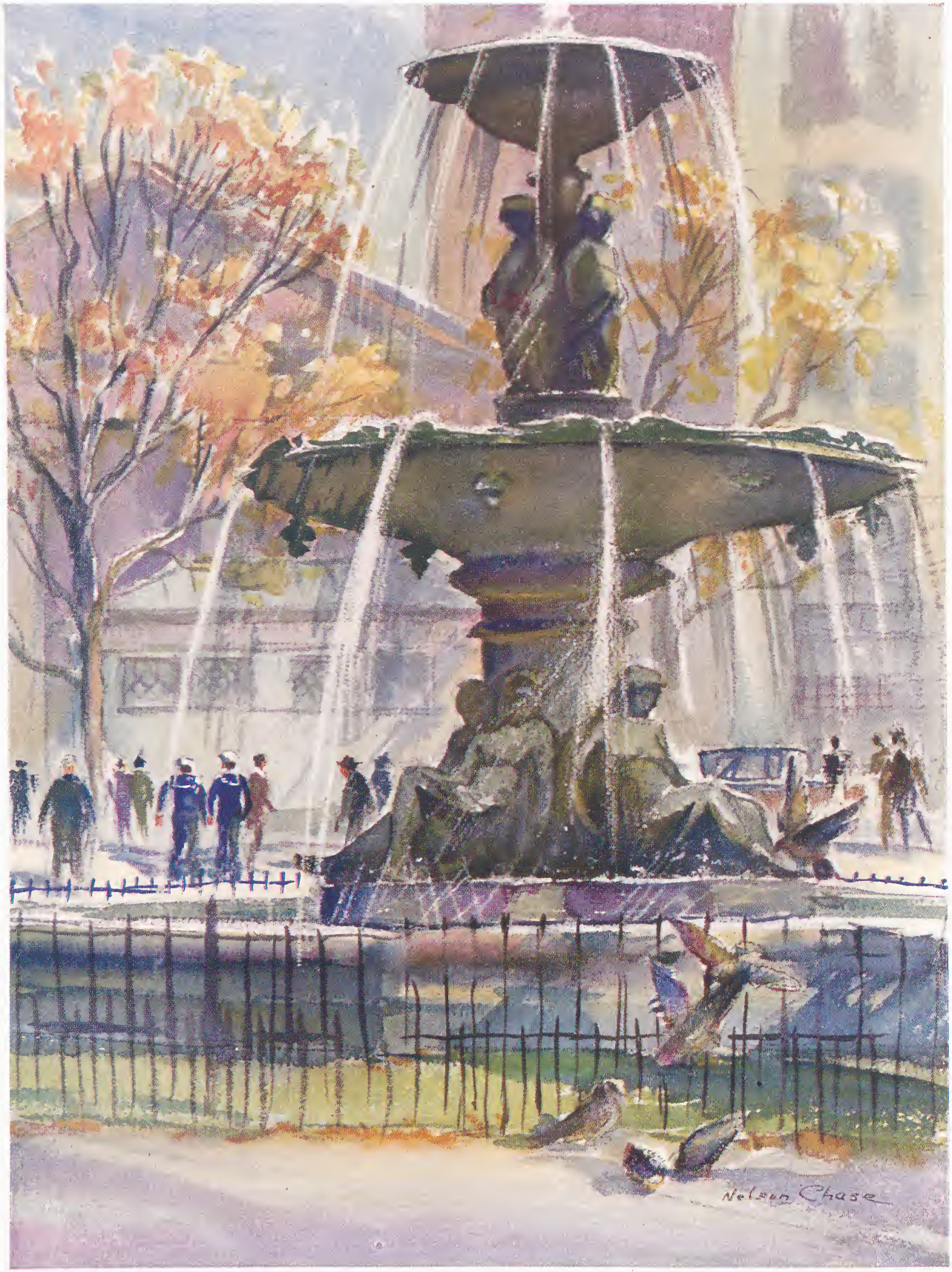
Here we have exactness without tightness, simplicity without meagerness, and harmony without monotony. Original, 17" x 10¾"

A WATER COLOR OF THE CHURCH AT RÄTTVIK, SWEDEN, BY EDGAR I. WILLIAMS

The color has been flooded on freely: there is no niggling or timidity: the composition is interesting. Original, 13½" x 10¼"

ON THE ROAD IN CONNECTICUT—WATER COLOR BY CARROLL BILL

This uses dark values, such as often frighten the beginner, with splendid effect. Original, 18" x 12"



BREWER MEMORIAL FOUNTAIN, BOSTON COMMON, AS SKETCHED BY NELSON CHASE

So hearty a style can be bred only of confidence. The use of strong contrasts adds vitality. Original, 18" x 24"

CHAPTER XIX

MORE ABOUT SKETCHING OUTDOORS

BEING MAINLY A COMPARISON OF SOME SKETCHES

Before we turn to an analysis of the accompanying outdoor sketches, it seems advisable to interject a word on the diversified aims and viewpoints of various painters, for, without knowing something of these, we may lack proper appreciation of their work. We shall confine our remarks to the conservative school, where the aim is to represent the subject matter with reasonable fidelity.

If one could look over the shoulders of a number of equally capable artists, simultaneously painting from exactly the same subject, in the same medium and from approximately the same station point, he would probably be surprised at the diversity of method and result. Sketches done under conditions such as these often exhibit such amazing dissimilarities that it is hard even to recognize them as painted from a common subject. If he could also read their minds he would perhaps be as much surprised by the different mental processes back of the varied methods and results, as by the methods and results themselves.

If we were to examine the sketches with a view of picking the best, the problem might be difficult. For the best sketch is by no means the one which sets forth most explicitly and exactly every element of the subject, as a fine photograph in natural colors might do. Yet it is hard to define what the best sketch really is. Sometimes it is the one which records most faithfully some aspect of the moment, whether of sunshine or shadow, heat or cold, tranquillity or action. Again it is the one which catches the finest harmony of hue, symphony of value, or beauty of pattern. Or it may be the one in which the artist discovers, beneath all such visible manifestations, some truth commonly unnoticed or unrevealed, and bares it for all to see. In other words, the best sketch is the one which most successfully conveys to the beholder such attributes or impressions of the subject as its creator wishes. It is a product of that great triumvirate—the eye, the brain, and the hand. The artist observes the subject, filters it through his mind, and places on paper the results of this filtration. It bears the imprint, too, of his subconscious mind—yes, of his very soul. Therefore it often expresses to the observer a deeper meaning than does the subject itself. It appeals to his intellect and emotions as well as to his eye.

To illustrate this matter, partially, the author points to an incident of a delightful sketching expedition along the Maine coast some years ago. Of a party of four, one was a painter, specializing in landscapes and marines, a second an illustrator, a third a designer from a landscape architect's office, and the fourth the author, with architectural inclinations.

One morning a quaint, weatherbeaten old fishing shack was selected by all four as a subject to sketch, and each set to work to interpret it. It was extremely interesting and profitable to compare the final results.

The painter finished first. His treatment was far from literal in that he made no attempt to represent the subject mass for mass, value for value, and hue for hue. Yet he caught a most vital impression of it. One could almost sense from his sketch the warmth of the sunshine, tempered by the cool breeze from the sea, the tang of the salt air, and the motion of the waves. In other words, he was able to grasp and register on his paper the spirit of the place and the character of the day. It is in this sort of thing that the painter excels. He knows that a quick impression, produced in the enthusiasm of his first contact with the subject, has, even when inadequate and faulty in some respects, a virility and convincingness lacking in the more calculated effort. Hence, he fritters away no time on minor details such as often seem vital to the beginner, but at once translates the leading essentials into rapid brush strokes and hasty washes.

The illustrator wove a bit of a story into his painting. On the rickety steps before the time-worn structure, he introduced the figure

of an old fisherman mending nets; in doing this he drew on his memory and powers of inventiveness, for there was no fisherman present. And he showed a cat in the sunshine of the open doorway and a pot of geraniums in the window. In other words, he seized upon the dramatic possibilities of the scene, producing a "sweet" sketch such as would be quite certain to have popular appeal. The illustrator is, in a sense, a playwright or a stage director. His figures are his actors and his settings the stage.

The landscape architect was particularly impressed by a group of wind-blown evergreens fighting for existence at the top of the ledgy bank which afforded foundation for the ancient structure. He evinced considerable interest, too, in the glacial markings of the ledge itself, sketching the entire bank in some detail. The building got meager attention.

To the author the building—which possessed, among other quaint features, a peculiarly truncated gable—was a rare find. A bit of metal conductor pipe, picturesquely staggering downward across the gable end from an old wooden gutter to a bright blue water cask, especially intrigued him, as did a pile of lobster pots, bleaching nearby, and the prow of an abandoned dory, half buried in the sand. These he featured.

Words are scarcely enough to make clear to what an extent the four resulting drawings differed. Yet despite their differences it would have been hard to say which was the best. Either that by the painter or the one by the illustrator would doubtless have been the choice of the layman, yet the others were attractive and served their purpose very well, and so, in their more humble way, were perhaps equally successful.

All this not only gives us greater insight into why paintings vary as they do, but it should be enough to show that unless we understand why a specific painting was made we have little means of judging how successful it really is. One should be cautious, therefore, about criticising the work of artists unless its purpose is known, always remembering that personal opinion does not necessarily constitute the truest judgment. Similarly, one can accept some types of unfavorable criticism on his own work with a grain of salt.

And so the author's comments on the accompanying illustrations (and on those elsewhere in the volume) should by no means be interpreted as appraisals of the paintings themselves, or complete descriptions of them. His aim has been merely to include examples illustrating certain typical matters of interest; to some of these he specifically directs attention.

First, we have the sprightly and robust outdoor sketch by Samuel E. Gideon, Plate 48. This not only shows a type of subject well suited to early sketches, but exemplifies a quick, spontaneous treatment such as the beginner could advantageously emulate. There is little reduction in size, so the technical method is clearly revealed. Not only is this sketch eloquent of the place, but it has caught its virility with great economy of means. Many parts were finished with a single wash, there being little superposition. See how the whole is interspersed, here and there, with tiny whites, or near-whites. Such lights are common to sketchy treatments in water color. Small areas quite easily escape the brush, particularly on rough paper, and little bands of separation are often necessary to prevent one wet wash from running into another. All these "accidentals" add life and sparkle.

Our painting (Plate 49) by Vernon Howe Bailey, noted artist, is again virile and direct. It was done with a very wet brush—a large one—with the color flooded on. Bailey feels that this makes for broader treatment, especially in the more detailed portions. This is one of a group of water colors each of which was completed in a single sitting of two or three hours, about half an hour being devoted to the pencil preparation. Mr. Bailey has used many of the finest papers but has come to prefer Fabriano hand made in medium surface, block form. We have listed his colors in Chapter I. It is interesting, while this drawing is before us, to compare it with his others on pages 324, 325, and 326.

The beginner sometimes feels that such a treatment as this is too "sloppy" to be good. There are fans, runbacks, and blurred edges which disturb him. With the growth of his appreciation he usually comes to realize that these matters are trivial and whether assets or not (often they are) they are not blemishes, as he thinks them. Sketches of this type, when done with sound reasoning behind them, as in this case, are in many respects superior to the customary "tight" or "labored" sort. Surely this result catches the spirit of the subject, and one feels the artist had a lot of fun doing it.

Whereas the hues used by Gideon and Bailey

are such as we constantly see in actual places and things, Camille Etienne Grapin, in his painting, Plate 50, while employing a similarly bold technique has interpreted his subject with a more lively gamut of color. It is not to be supposed that this sketch matches hue for hue (in detail at least) the original subject. We have already explained, however, that a treatment of this character, in which certain liberties are taken, may be fully as truthful in the general impression created as any other type. Here, under a skilful hand, the subject has become a living one. As a point of technical interest, notice that the buildings in the left foreground were constructed with a soft carbon pencil, while for the church in the center a red pencil was employed. Colored pencils are very useful in such layout work. They help the artist to feel his way into his subject, and they merge successfully with the colored pigment later added. This painting was done on plain white smooth water color paper.

Now let us refer to the sketch by Jean Jacques Haffner, Plate 51, which also has many delightful qualities. Its interesting subject matter is restfully composed, the converging lines of buildings and street leading the eye towards the center of the picture. Here a focal point has been developed, which includes the central figures and the lower portions of the buildings behind them. In this area we have greater detail and cleaner cut contrasts than in the rest of the subject. The reddish tone used in the old palace before the spectator helps to sustain the interest in this part of the sketch: it is enhanced by the nearby greenish hues. The whole composition, in fact, shows a clever interplay of reds and greens, a bit of red carried into nearly every green and vice versa. The yellowish tone in the immediate foreground not only terminates the sketch nicely, but it helps in the creation of a splendid feeling of space, for from it the eye jumps across the shadow to the center of the subject. The alternate striping of dark, light, dark, on the building at the right produces a somewhat similar result, though here the eye is more likely to be momentarily arrested by the central warm band. Note the well suppressed farther portions of the palace, which take their place properly in the background. The dark building at the left contributes to this effect through contrast. Technically, the handling is superb, though the pigments have been so manipulated that it is not easy to know just how some of the effects were obtained. There are touches of opaque color here and there, notably in the building at the right. These give this portion somewhat the appearance of an oil painting.

Samuel Chamberlain's vigorous example, Plate 52, reveals its method more clearly. It was done on a sheet of medium rough handmade French water color paper. The subject was quite completely sketched with carbon pencil, the lines still being plainly visible. The colors were then applied as transparent washes, merged and graded freely as laid. As in the case of the previous example, the chromatic arrangement is such as to insure balance, for we find a very rich pattern consisting mainly (if we except the sky and the foreground shadows) of closely woven but well distributed small areas of contrasting hue.

A striking feature of this study is the freshness of tone and sharpness of edge. Note, for instance, the definite manner in which the awnings have been thrown into relief. Observe, also, the crisp shadows. There is everywhere contrast of value as well as of hue. One feels that the work was carried forward fearlessly with a quick, sure hand.

Subjects in some countries would never show such crispness. Remember the appearance of a subject depends not alone on its local tones, but also on climatic and atmospheric conditions. In other words, subjects have moods affected by such things as temperature, wind, sound, the time of day, period of year, and position of the sun. With this thought in mind, it should be helpful to turn for a moment to Jean Hebrard's drawing, Plate 109, page 227, for though the subject matter here is quite unlike this of Chamberlain's, and the colors far from the same, these dissimilarities only emphasize this truth that subjects do have moods. For just as Chamberlain has caught one kind of subject in one kind of mood, so Hebrard has caught another, his painting, with its softness of edge and sobriety of tone, giving a sense of tranquillity. These drawings of course picture only two of many possible effects which may be achieved as mastery of color handling is acquired.

As an example quite different both in subject matter and treatment, we now turn to Cass Gilbert's water color, Plate 53. This might be called a typical architect's study, recording the subject faithfully by means of straightforward handling. There is nothing

tricky here, no attempt to display technical cleverness nor to interpret illusive impressions. One feels that this famous architect of the Woolworth building learned a great deal from the careful study involved in the making of this painting. It is interesting to note the successful treatment of such details as the steps, flagstones, etc.

As Plate 54 we reproduce a second drawing by the same artist. This has a more subtle approach. Observe, for instance, the variety of hue in the right-hand portions; the somewhat vague, but sufficient expression of the arcade, and particularly of the ornamental columns with their intricate caps and bases. Here is breadth of effect coupled with infinity of detail. There is also an atmospheric quality to this study which is quite unusual: the artist records not merely the details of the subject matter, but the spirit of the moment.

To show again how varied both subjects and handlings can be, we refer the reader to Plate 30, page 93, by Lionel H. Pries. We have already called attention to its textural characteristics. We turn to it now more for its composition and richness of hue. Note the manner in which the figures near the center, together with the shadows and other deep tones on the fountain and its base, plus the darkened fronts of the buildings at the right, create a sort of silhouette to contrast pleasingly with the light areas beyond. See how the monumental column, and the features to the immediate left of it, have been sacrificed as they were brought down, in order to make this contrast definite. Thus a feeling of brilliancy and depth was created. The buildings at the extreme left and right, particularly the latter, are pleasingly rich in hue and satisfying in technical handling. As is evident at a glance, this painting was made on fairly rough water color paper, with full advantage taken of its texture. The palette included the following transparent pigments: alizarin crimson, cadmium pale, yellow ochre, raw sienna, burnt sienna, cerulean blue, French blue, and emerald green.

In Plate 32, page 96, we again have an example by an architect, the late William T. Armstrong. If the student had before him subject matter as complex as this, he would quite surely be embarrassed as to how to render it. Here the artist has shown us one good method. He has painted with accuracy the major forms but without niggling over the details, which are cleverly and economically suggested. In this suggestion he has utilized to the fullest the texture of the Whatman cold pressed paper, doubtless by means of a somewhat dry brush. To bring order out of the chaotic complexity of the subject matter, Armstrong wisely chose to darken the principal archway of the main entrance, so it not only becomes a definite center of interest, but shows the proper depth and importance in relation to the flanking features which have been left light. The figures have been grouped and treated in a satisfactory way. The tendency of the beginner is always to draw figures as individual things. He sees an empty space and sketches a figure; this makes another space seem empty and in goes another figure. This continues until his ambition is satisfied or all vacancies are filled. Instead of this haphazard process, one should arrange figures methodically, with feeling for design. Those in this painting are so arranged. Near the building we have people massed in varied groups; they give scale and contribute living interest. The foreground figures add to the effect of distance and serve to lead the eye into the composition. The larger figure towards the left, and the small seated ones at the right, nicely round out the group. Mr. Armstrong painted with a palette containing aureolin yellow, rose madder, French blue, cerulean blue, cobalt, and emerald green.

The two sketches by Ernest Born, published as Plates 55 and 56, dramatically exemplify the fact that one can work with extreme individuality and at the same time represent his subjects naturally. Although in subject matter, color schemes, and composition these are not extraordinary, the manner in which the pigment is applied is highly distinctive. For while many areas were toned, as with wash, the brush was frequently used as a linear tool, with the strokes disposed in a rather decorative way. As to color, both sketches are, in effect, somewhat neutral, particularly if held at a distance, for though bright hues were employed, especially in Plate 55, they are in small areas. This plate, incidentally, was done on a sheet of Strathmore charcoal paper of a pale bluish tint, while for Plate 56 the same paper, but of a warmer tone, was selected. Both subjects were roughly laid out in pencil, after which the colors were applied, transparent pigment being chosen for the bulk of the work. Some of the colors on Plate 55 were opaqued with

Chinese white for certain finishing touches; note the foreground trees, the pier at the left of the large archway, and so forth. We call attention again to Born's palette, Chapter I, with its accompanying suggestions.

A bit similar in both subject matter and handling to this work by Born, though pitched to a warmer key, is the sketch by Charles A. Bradbury reproduced as Plate 57. This was made with a combination of transparent and tempera colors. The employment of chrome orange and vermilion in the sky is unusual but consistent with the rest of the composition. The steelwork is very well indicated: this sort of thing is often extremely hard for the beginner, partly because it looks so complicated that it frightens him. Here just enough has been done to give an adequate impression of the subject, and no more.

It is instructive to turn from these very active examples to the delightfully passive presentation of architecture by Paul P. Cret, Plate 58, with its wholly different treatment. Here, in place of the previous free intermixture of hue, a single color (in effect) has been used, with but rare exceptions, for each area. The sky, for instance, while revealing evidences of several hues, is, in general appearance, one all-over tone. (This tone, incidentally, is much like some of those on Plate 26, page 88, both in hue and texture.) Though most of the individual areas throughout this sketch are treated with like simplicity, the impression of the whole is extremely rich, partly because of textural interest and partly through good relationship of hue. This proves conclusively that one can get satisfying results by comparatively simple means if he knows how to do so. It further demonstrates that if one understands the trick he can render every feature he sees, even in such a complex subject as this, fully and plainly without offense to our aesthetic sensibilities. We should not leave this painting without reference to the shadow tones, which are remarkably well handled. Those of the porch have exceptional transparency and depth, and are wholly free from the muddiness which characterizes so many student attempts. This painting was done on rough water color board. Professor Cret's palette was published in Chapter I.

Now, by the way of further variety, let us examine the dashing sketch by Edgar I. Williams, Plate 59. The effect here, as in his previous example, Plate 39, page 108, is bold, honest, and natural. The sky is well handled, as is the foreground. The grass, shrubbery, and trees should be of especial interest to the student; the tree shadow on the building is worth attention. The composition, with its two nearly equal vertical divisions, is unusual: with such an arrangement it is very easy to lose the proper feeling of unity, the whole becoming two paintings rather than one. Here the strong horizontal base is the prime redeeming feature, aided by the fact that the left-hand vertical unit is much more lively than the right, reducing the rivalry between the two. Such a subject is easier to treat when it has more building and less landscape or vice versa. Needless to say, these unusual compositions, when well integrated, please us more than do some of the conventional hackneyed type.

Another sketch with plenty of dash and vigor is that by Carroll Bill, Plate 60. This again offers splendid proof that we can use considerable dull, dark color to advantage, and without causing gloomy effects, providing we contrast it with a few areas bright in hue (which will appear all the brighter because of the adjacent neutrality), and different in value. It's quite a trick, though, to get these dark tones on without making mud. One must work directly, stirring up any under color as little as possible. As to means and method, this was done on Whatman medium rough white paper, using Winsor & Newton tube colors. The sky was laid with cobalt and yellow ochre. For the house, raw sienna, blue, and Venetian red were employed. For the foliage, raw sienna was chosen, together with emerald green, darkened with blue and lightened with light cadmium yellow. In the lightest parts of the painting the paper was allowed to show through thin washes. No thick white was used. Mr. Bill advises large sable brushes as the way to get broad effects.

It should prove helpful to compare this painting with that by the same artist, Plate 80, for similar as these are in their boldness of conception and execution, they are strikingly different in color and value arrangement. In the latter, though we still have a single central building as the main motive, it has been treated as a light and warm-toned mass against a dark complementary sky. The hues of the sky and building have been nicely recalled in the entourage, yet in such limited areas that they do not interfere with the dramatic simplicity of a single warm area against an op-

posing cooler one. This painting was done on Whatman medium rough white paper with Winsor & Newton tube colors. For the sky, French ultramarine was employed at the top, a little Prussian blue and water added as the wash went down, and a bit of lemon yellow at the horizon. The mountains were done with French ultramarine and a small amount of crimson. For the foliage, raw sienna and emerald green were used with the addition of blue for the heavy spots. Venetian red and raw sienna were chosen for the foreground and the flat field. The building itself was rendered with raw sienna and light cadmium yellow. The low houses were left white with shades and shadows of ultramarine and raw sienna. No white or body color was used. The whole was painted with a free, wet wash and the small details put in when dry.

Nelson Chase's painting, Plate 61, is still another bold and spontaneous treatment, again giving us marked contrasts in value and hue. Once more we have a "drawn on the spot" look which many sketches lack. The figures, the wind-blown water, and the birds add to the impression of real out-of-doors. The sunshine and shadow look convincing. The background is especially worthy of commendation, for it is nicely suppressed, the indefinite windows and the like holding their places. It would have been a very simple thing to have muddled this subject, so interweaving foreground and background as to create confusion. As treated, the background forms a light, yet adequate mass against which the fountain, figures, etc., stand out in bold relief. The water overflowing from the fountain is indicated mainly by knife scratches.

Mr. Chase has this to say of his own work: "I am really striving for directness, simplicity, and a good relation of values and color. That is enough to keep a person on his toes for life. I try to think in terms of red, yellow, and blue —warmer or cooler—darker or lighter—big comparisons and no tricks. I find it more stimulating to sketch right on the spot, taking about an hour and a half, but am not wholly against cooking a picture from notes."

In Plate 87, by Samuel Chamberlain, we have quite a different cutting of the picture area, the subject introducing portions of so many separate buildings that, had it been less skilfully unified, it might easily have turned to hash. Unification was brought about mainly through the use of a comparatively simple palette which permitted the weaving of the whole into a rich ensemble predominantly warm. This sketch was done on a sheet of rather rough French water color paper. The soft pencil layout which underlies it was made carefully, though freely, even going into considerable detail, so that it counts perceptibly in the finished work. The color was applied in transparent washes, using plenty of water.

J. Olaf Olson's delightful painting, Plate 178, page 327, though not, strictly speaking, an outdoor sketch, fits well into our present discussion. It was done on Whatman 140 pound rough paper. Olson applies his color with a large brush, say No. 18, and two or three smaller ones, all of selected sable. He never stretches his paper but tacks it dry to a board. His method varies somewhat according to subject, but in the main he works from light to dark in big, simple washes, using enough water to flow freely and yet not so much that it gets beyond control. A few accents put in crisply where needed add form and depth. Mr. Olson's palette contains all the colors he finds necessary, and he is careful to avoid fugitive pigments. He uses ultramarine blue, cobalt blue, cerulean blue, yellow ochre, raw sienna, burnt sienna, raw umber, cadmium lemon, cadmium medium, viridian green, vermilion, alizarin crimson, and ivory black. The black is seldom used and it is possible to get along without it. Chinese white is employed, if at all, very sparingly. This example is reproduced through the courtesy of Mrs. Frank Howard of New York.

CHAPTER XX

TREES AND LIKE LANDSCAPE FEATURES

WITH STRONG EMPHASIS ON HONEST OUTDOOR STUDY

We shall now give attention, in this and the next few chapters, to some of the individual features or details which cause both the artist and the architectural renderer the greatest difficulty.

First we shall take up trees, together with such related things as bushes, vines, flowers, and grass. These present a real stumbling block in the path of the student; his early attempts to represent them are often amazingly bad.

To lay a firm foundation for knowledge in this direction, one could hardly do better than read some of the many good books devoted to the subject. To pick one at random, *Our Trees: How to Know Them,* by Emerson and Weed (Lippincott), though not primarily for artists, is fine. Another splendid volume, this time approaching the subject from the artist's point of view, is Rex Vicat Cole's *The Artistic Anatomy of Trees.* This comes from England and deals mainly with species native to that country, yet it offers many suggestions applicable to the representation of our own. Other useful books are *Trees in Winter* by Blakeslee and Jarvis (Macmillan), *Human Side of Trees,* by Dixon and Fitch (Stokes), and *Our Native Trees,* by Keeler (Scribner's).

A careful perusal of a few such volumes will not only familiarize one with the names and leading characteristics of the more common varieties, and train him in the laws which govern their growth, but should, also, strengthen his love and appreciation of the beautiful in nature. One should come to realize, at least, that a tree, instead of being a sort of gigantic green lollypop stuck in the ground (an effect common to beginners' work), grows from it—is supported and sustained by it—and that its appearance depends not only on species but on such other factors as character of soil, climate, direction and amount of prevailing wind and sunshine, and the influence of neighboring trees, buildings, hills, etc. The artist must learn, too, that the

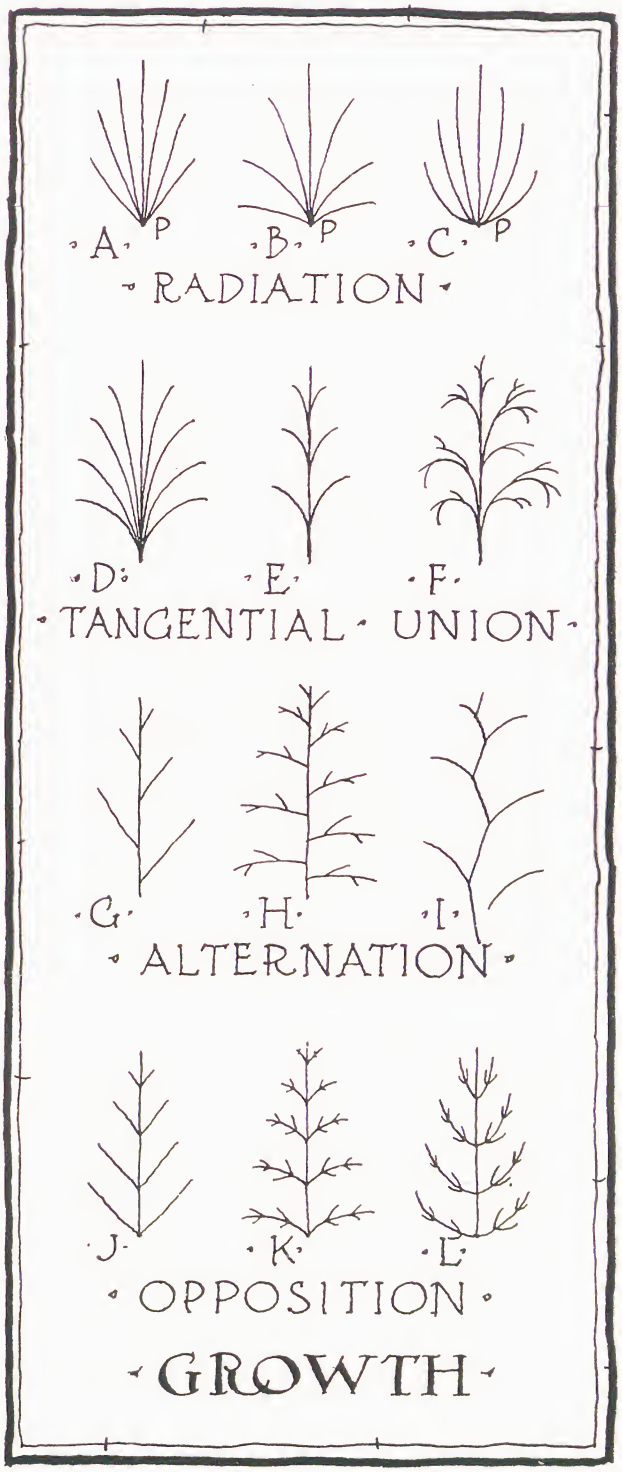


FIGURE 61

1 · THE ANATOMICAL STRUCTURE OF A TREE IS MOST IMPORTANT

THE SKELETON

STEP ONE · THE TRUNK AND MAIN BRANCHES ARE PENCILLED FIRST

2 · THE DIRECTION OF THE LIGHT SHOULD BE CONSIDERED

STEP TWO · FOLIAGE MASSES ARE NEXT OUTLINED AND TINTED

3 · TEXTURE PRODUCED BY PENCIL

FINAL STAGE · THE RENDERING IS CARRIED ON VERY BOLDLY

4 · COMPLETE LACK OF STRUCTURE IS EVIDENT IN THIS EXAMPLE

WRONG!
THESE BRANCHES FAIL TO "FOLLOW THROUGH"

DON'T NEGLECT TREE ANATOMY!

BUILDING A TREE UPON ITS "BONES": SOUND CONSTRUCTION IS ESSENTIAL

The student should give early attention to anatomical fundamentals

tree, like any other growing thing, has certain consistencies of growth which cannot be ignored.

This last fact we have endeavored to make plain by our sketches in Figure 61, which are included more as a means of calling attention to this matter than as an explanation of it. The principles involved apply to many forms of plant life, both large and small.

When we glance at a tree, its method of growth—alternation, opposition, etc.—is not always immediately evident, but usually reveals itself on close examination. The student should try to discover the fundamental growth characteristics of any tree which he draws, and should proceed with them in mind. He will sometimes find that one main principle is followed consistently in every part of a tree. Again, more than one is involved. When trees apparently fail to fit into any definite classification, it is often because they have met with a series of accidents, such as broken limbs, and the evidences of system are thus obscured.

FIELD TRIPS: ANATOMY Whatever one may learn about trees from books should be clinched by a critical survey of actual examples outdoors, so he should go to park or country, sketch book in hand. He should sketch much and observe more. Notes should be added to each sketch.

An ideal time for the first of these field trips is when the trees are free from foliage, or practically so, for one is then able to observe, under ideal conditions, that most fundamental thing, the tree skeleton (see 1, Plate 62). Just as the artist who hopes to draw the human figure successfully must be fully as familiar with the hidden skeleton as with the muscles, flesh, and skin which clothe it, so one ambitious to represent trees in more than a superficial manner must have a knowledge of such "bones" as trunk, branches, twigs, etc. Perhaps the need is even greater here, for the tree skeleton is often exposed.

One should examine each skeleton from far away and near at hand, noting not only its form but also its value, hue, quality of bark, etc. He should put to himself such questions as the following: Is the trunk single or forked? Straight or curved? Vertical or tipped? Is it smoothly rounded or ridged? Do the branches point up or out or down? Do the smaller twigs seem to merge as they terminate against the sky, or does each stand out by itself? Are the roots exposed? What of the value and hue of the various members? Are the areas in light much different from those in shade? Do some members cast shadows on others? How dark do the shadows seem? Does the entire skeleton exhibit any peculiarities of growth not typical of its species, as though permanently bent by sun or wind, or disfigured as by ice or neighboring trees?

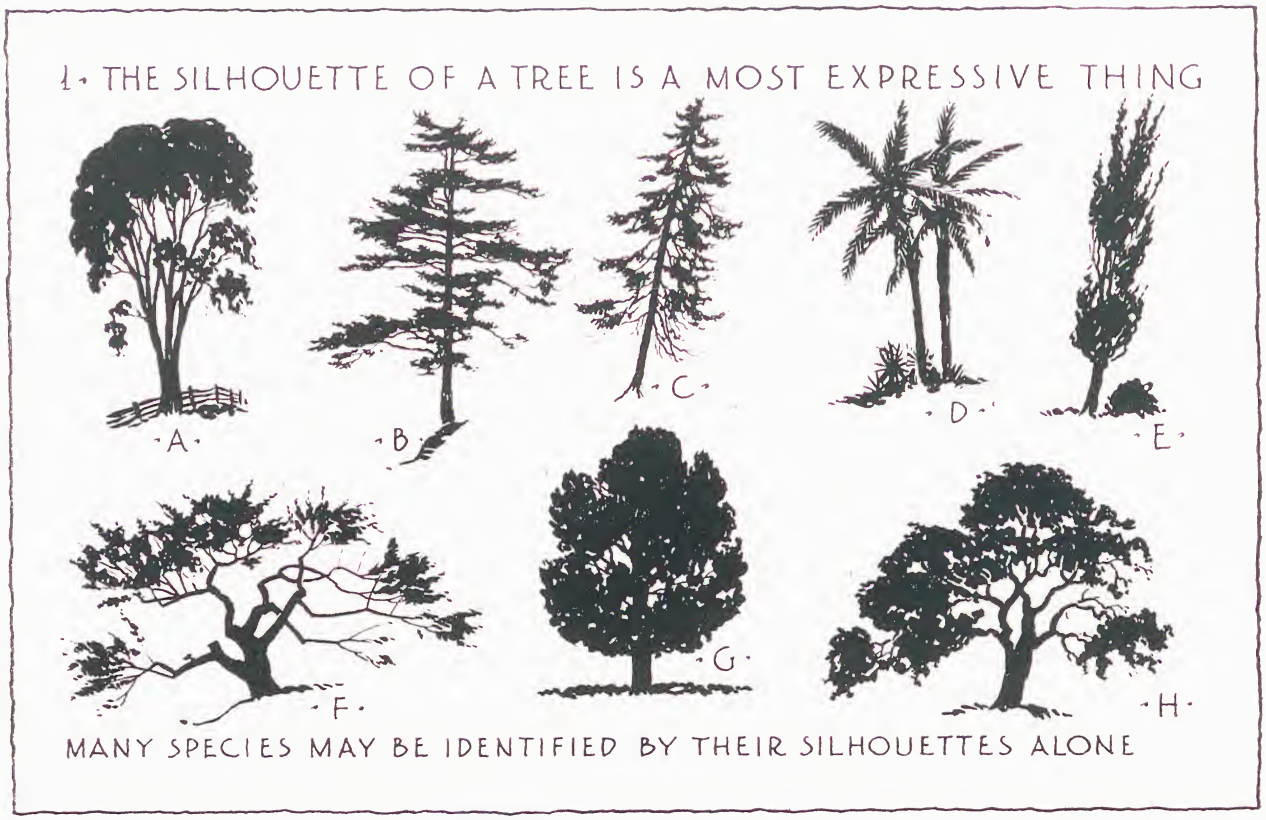
It is not only the skeleton which should be studied in this analytical manner: similar observation should be made of trees in partial and full leaf.

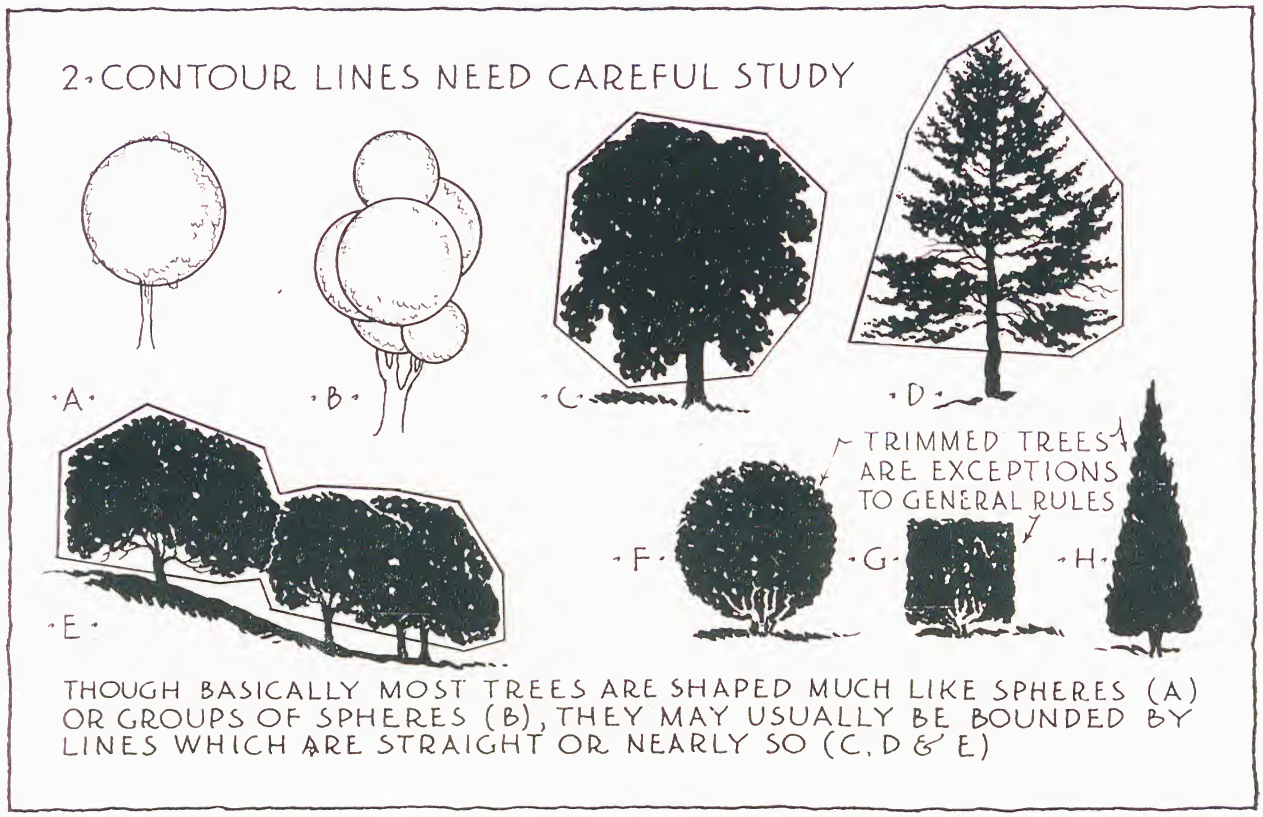
The camera can be of real help in all this. Much can be learned, for instance, by making a number of series of progressive photographs of typical trees, each series showing a given tree as seen from the same point at different seasons and under different lightings. One photograph would show the skeleton, one the scanty foliage of spring, one the full leafage of summer, etc.

Plate 62 was designed to give emphasis to the importance of becoming familiar with tree anatomy. The skeleton of an old elm, at 1, was done with considerable care from a photograph snapped by the author in winter. At 2 and 3 are shown two stages in the development of a sketch made from this same tree in midsummer from the identical point of view. In starting the sketch, all of the larger "bones" which were visible were first drawn, much as at 1, but more freely. Though the less essential or hidden ones were omitted, their general direction was indicated. Next the foliage masses were blocked in with due attention to direction of growth. After this, light washes were applied to model the bones and the separate masses of foliage (see 2), the location of the sun being considered. In the completed sketch at 3 the whole was more fully modeled, and the texture of the leafage interpreted by means of both brush and pencil, the latter held flatwise. Note the great difference in the values in sunshine and shadow. At 4 we see faults such as often appear when the artist neglects structure: here there is a lack of proper anatomical relationship between the bones above, at the center, and below.

EXERCISE 50: SKELETONS Make, from nature or the photograph, many anatomical sketches of different species of trees, attempting to memorize the forms as you do so. Try details of roots, bark, and the like.

SILHOUETTES One of the best ways of learning to express both tree anatomy and con-




2. CONTOUR LINES NEED CAREFUL STUDY
A
B
C
D
E
TRIMMED TREES ARE EXCEPTIONS TO GENERAL RULES
F
G
H
THOUGH BASICALLY MOST TREES ARE SHAPED MUCH LIKE SPHERES (A) OR GROUPS OF SPHERES (B), THEY MAY USUALLY BE BOUNDED BY LINES WHICH ARE STRAIGHT OR NEARLY SO (C, D & E)

SILHOUETTES TEACH US THAT MASS IS FAR MORE VITAL THAN DETAIL

The student's emphasis is all too often on matters of technique

tour (the two are really inseparable) is by painting silhouettes such as we show on Plate 63. Study these with care. With trees thus reduced to their lowest terms we learn that intricacy of detail is not the prime requisite to their adequate representation, but that much can be expressed through attention to fundamental forms. Mass, in other words, is far more vital than detail.

EXERCISE 51: SILHOUETTES Make silhouette drawings on the order of those on Plate 63. Work directly from nature, if possible. Use brush or coarse pen and black ink or dark water color. Represent only the principal elements. You will learn that trees vary in basic shape to a surprising extent.

VALUES Not only should the student acquire this fundamental knowledge of tree anatomy (skeletons, contours, etc.), but he should learn something of tree values. As in other subjects, these depend on local or natural tone, and on light, shade, and shadow. Values due to lighting are extremely complicated, for a tree, as it customarily appears in full leafage, not only reveals modeling of its entire mass, but shows gradations of tone in each individual leaf and branch. Literally thousands of light and dark areas are visible. Obviously all these cannot be represented, so one's problem is to learn to suggest.

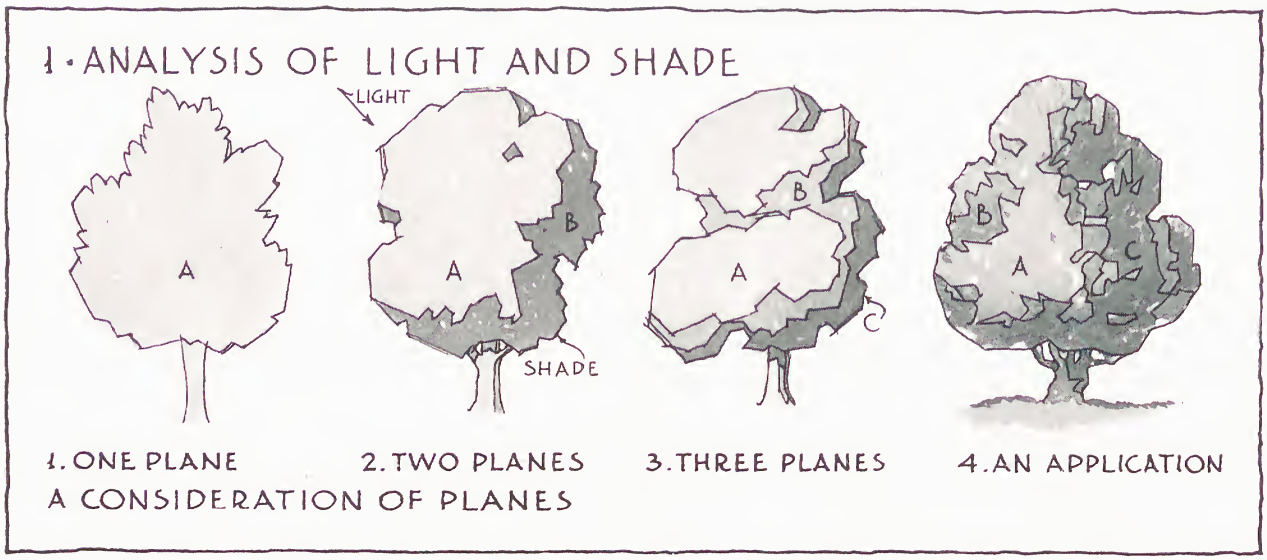
A good approach is to think of the typical tree as shaped like a ball or a group of balls (*A* and *B*, Sketch 2, Plate 63, and *A* and *C*, Sketch 1, Plate 65). As these last examples show, the normal shade area of a sphere takes something of a crescent form. If we think of a tree as a group of intersecting spheres, as at *C*, with each sphere bearing a crescent-like area of shade, the shade of the whole roughly consists of these crescents in combination, plus such shadow as one sphere may cast on another.

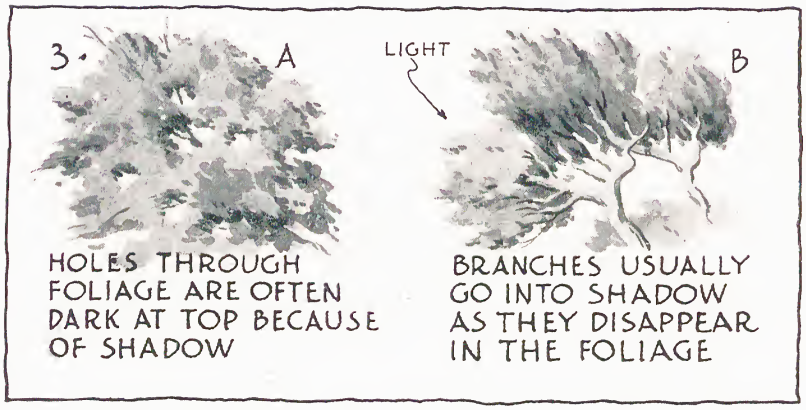
But trees are not actually so regular in mass, and it is seldom that shade areas can be so clearly defined. Sometimes, in fact, it is impossible to discover any definite lines of demarcation between foliage areas in light and in shade, our sketch at *D* showing how they merge. This is particularly true if one stands so near a tree that he observes all the slight variations of value, so it is better to judge trees, so far as essential differences of tone are concerned, from some distance.

HUE As to hue, if it were not for this matter of light and shade we could often represent a tree satisfactorily as at 1, Sketch 1, Plate 64, a wash of green on the foliage and another of brown or gray on the trunk serving the purpose. One can seldom divorce hue from value, however, which greatly complicates the problem. But here is an exercise designed to simplify it somewhat.

EXERCISE 52: PLANES Make from nature some sketches similar to those in Sketch 1, in order to learn how to represent the combination of local color and light and shade in the simplest possible manner. Try a few on the order of that at 1, seeing how expressively you can represent trees in a single flat plane. Use any colors you wish; shape your profile with care, but don't use an outline as here. Next, try some as at 2, allowing one flat wash of color to represent all the foliage in light and a second one all the foliage in shade. In subsequent work from nature, always try to see (or sense) these two fundamental divisions. Now, to get a bit closer to true appearances, paint some trees in three divisions, or planes, as in our third sketch. Here *A* stands for the light, *C* for the dark, and *B* for the middle values. The sketch at 4 again shows this general scheme; this is merely a somewhat more elaborate application of the principle of simplifying complex values by dividing them into a few definite areas or planes.

Not only will this practice teach you to look for the broader divisions of value, rather than the less essential ones, but it will prove that trees, especially if somewhat distant, can be quite well suggested by simple means. Obviously when trees are nearby, or are shown at large scale, it is necessary to indicate a reasonable amount of their detail. Sometimes even individual leaves are pictured, as in J. Floyd Yewell's painting, Plate 131, page 264. Trees in backgrounds or in conventional renderings, on the other hand, can actually be represented by flat planes. This we demonstrate in some of the sketches at 2, Plate 64, and again at *C*, Sketch 2, Plate 69. The first of the former sketches represents a group of shrubs by means of a single flat wash; in the second, two bushes, one behind the other, are painted with two flat washes, the nearer one the lighter; in the example just below this the values are reversed. The third sketch in the upper row shows how a sense of distance can be created by the use of three planes, each darker than the one behind it. In this connection, see the larger study at 1, Plate 95, page 208. The lower left-hand corner sketch at 2, Plate 64, presents a less




3 ·
A
LIGHT
B
HOLES THROUGH FOLIAGE ARE OFTEN DARK AT TOP BECAUSE OF SHADOW
BRANCHES USUALLY GO INTO SHADOW AS THEY DISAPPEAR IN THE FOLIAGE

VALUES DEPEND ON LOCAL TONE AS MODIFIED BY LIGHT, SHADE, AND SHADOW

One should make many studies in wash as preliminary to color work

usual effect, where light shrubbery is left in silhouette against dark. Such an area generally looks empty unless modeled. Often, however, portions of trees or bushes—especially their tops—can be left light against dark. The last little sketch at 2 exemplifies this. Try sketches to clinch these thoughts.

HOLES THROUGH FOLIAGE One of the difficulties sometimes encountered, particularly when one works in wash rather than color, is to make holes through masses of foliage look like holes. Too often they appear to be highlights. Any opening through the thick foliage of a tree has, as a general rule, an area of leaves, either above it or beside it, which is in deep shade. Hence in representing such holes, especially if through sunlit masses, it is quite common practice to edge them with dark towards the source of light. This is illustrated at *A*, Sketch 3, Plate 64.

Now and then one is troubled to know how to render small branches so they stay back properly among neighboring leaves. He can usually solve this problem if he remembers that branches customarily go into shadow as they disappear into foliage: closely inspect the sketch at *B* in the illustration just mentioned and you will find that each branch is darkened as it is lost among the leaves.

TRUNKS AND BRANCHES Foliage is not one's only problem, as we have seen; he must learn all he can about the bark enclosed members. The beginner frequently thinks of bark as uniformly gray or brown. It scarcely occurs to him that it reveals a great variety of values and hues. "Bones" in dazzling sunshine, especially when smooth, sometimes appear as light as one's paper and can be so represented, while in shade or shadow they may seem nearly black. Sketch 3, Plate 62, reveals something of the variety of value which one finds in the skeleton of almost any tree. This point is further illustrated in the sketches at 4, Plate 64, which remind us that we often see light branches against dark, or vice versa. The one at *C* demonstrates that shadows cast by branches on trunks or other branches are usually quite prominent and hence should be so portrayed. This also shows that such members are sometimes lighter in effect than the sky beyond. As to the hue of all these members, not only are the local colors of different barks divergent but they are modified in many cases by mossy growths, etc., some of which are particularly colorful when wet. Also, like all things, bark differs in appearance according to the kind of light which illuminates it. Towards sundown, for example, it often looks pink, yellow, or orange in light, and blue or violet in shade or shadow.

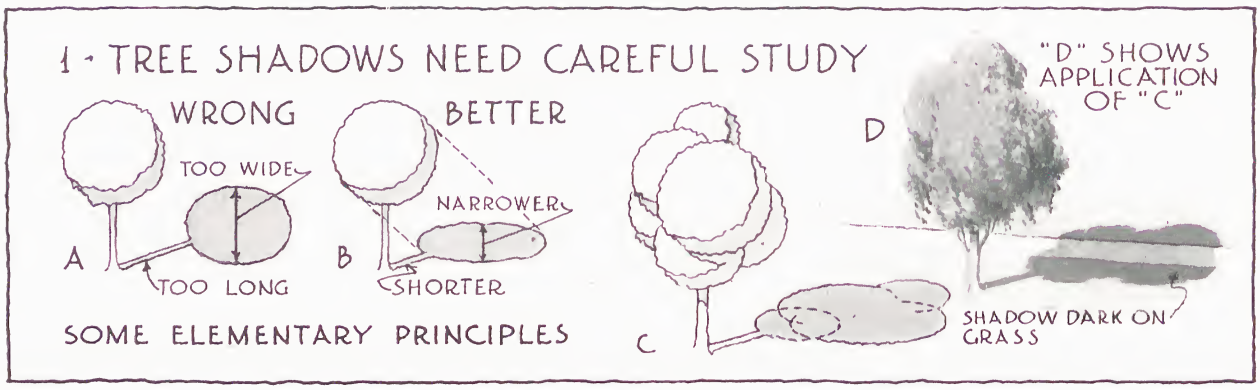
EXERCISE 53 Make sketches to illustrate some of these last points.

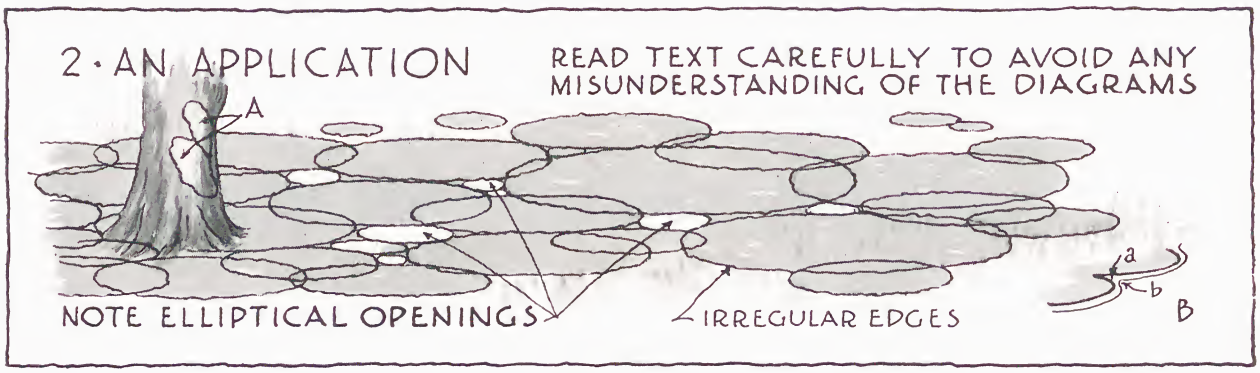
EXERCISE 54: TREE SHADOWS Next let us consider the shadows which trees cast on the ground, or on neighboring trees and buildings. The beginner usually has trouble with these, getting them wrong in shape, value, and color, and poor in technical indication. So spend a few hours studying and sketching them. You will discover that a tree shadow's appearance depends not alone on the shape and character of the tree itself, but on the nature of the surfaces on which it falls.

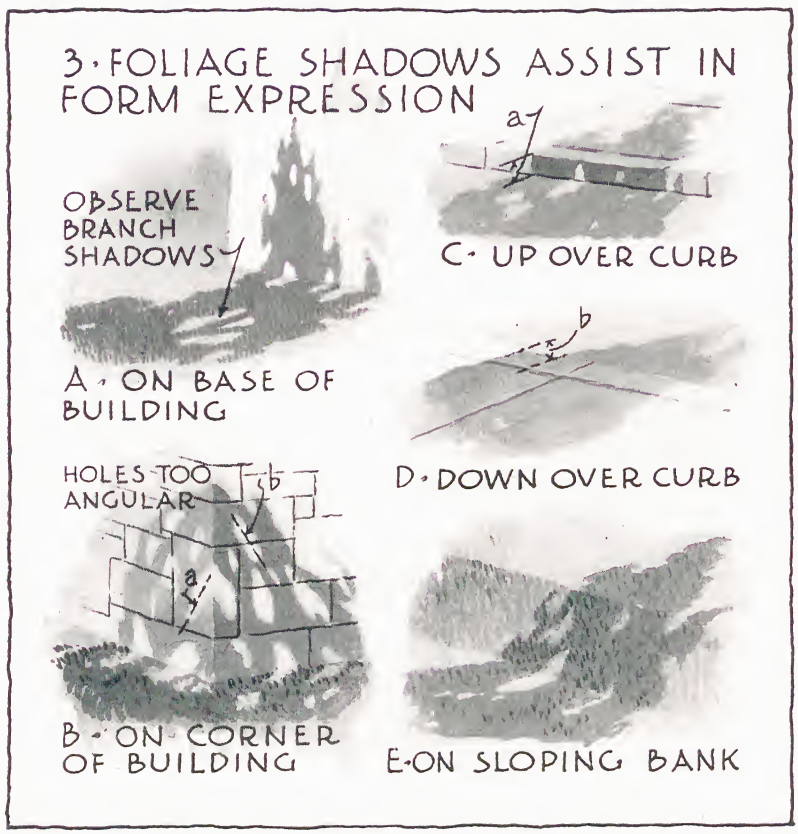
First, a word as to shape. We illustrate diagrammatically at *A* and *B*, Sketch 1, Plate 65, the beginner's common mistake of failing to foreshorten a tree shadow sufficiently. This causes a tipped-up look, the shadow failing to lie flat. He also often paints the shadows of trunk and lower limbs too long, forgetting, perhaps, that portions of these members are customarily in shade and so cast no shadows. *B* shows a correction of the faults pictured at *A*.

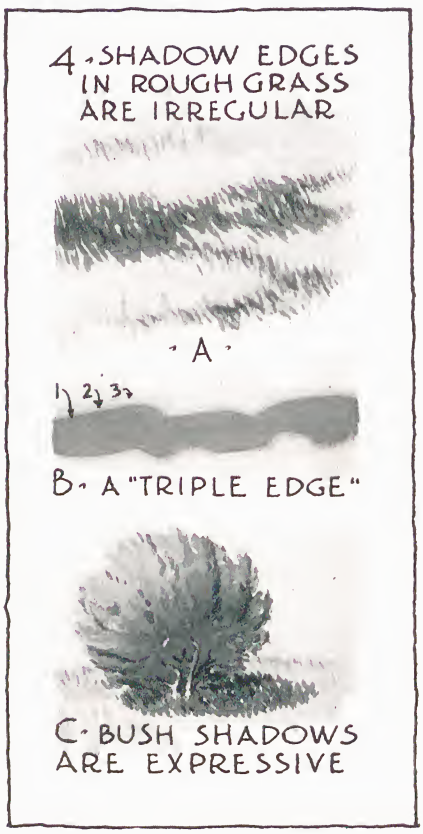
Note that the main shadow here at *B* is elliptical in form, as is the general rule. If we imagine a tree to be made up of several spheres, as at *C*, we can think of its shadow as consisting, roughly, of a number of overlapped or interposed elliptical shadows, so merging as to form a single one, bounded by more or less elliptical curves. Trees are not combinations of exact spheres, of course, and their shadows always show variation of contour, yet it is true that in general shape they usually do exhibit suggestions of elliptical origin. See *D*. (While this sketch is before us we should perhaps point to the shadow values: note that where the tone falls on the rather dark surface of the grass, it appears darker than on the light surface of the concrete walk.)

These ellipses just mentioned are not the only ones common to tree shadows. Lay a large sheet of paper horizontally in a position where masses of leaves in sunshine can cast their shadows upon it (yet not so near that each individual leaf throws a shadow exactly silhouetting its own shape), and you will observe, if lighting conditions are right, the strange phenomenon that all the various parts of the






3 · FOLIAGE SHADOWS ASSIST IN FORM EXPRESSION
OBSERVE BRANCH SHADOWS
A · ON BASE OF BUILDING
a
C · UP OVER CURB
b
D · DOWN OVER CURB
HOLES TOO ANGULAR
B · ON CORNER OF BUILDING
E · ON SLOPING BANK



TREE SHADOWS ARE EXTREMELY EXPRESSIVE AND DESERVE CAREFUL STUDY

In work of this sort keen observation of nature is a requisite

shadow appear bounded by curved lines, or at least have all angles rounded. If there is sufficient breeze to keep the leaves in motion, their individual shadows will constantly attach and detach themselves to form a composite shadow, and there will always be a softness of edge and a roundness of corner. Little circles or ellipses will form, disappear, and reform. This is due to the diffraction of the light rays. Study this phenomenon further by casting a shadow of your open hand on the paper, holding it several feet away. Spread your fingers slowly, noting the roundness of the bright spots which take shape as the light leaks through. Both these tests will demonstrate that many shadows, regardless of the objects casting them, seem to consist of rounded forms, frequently interspersed with rounded light areas. These rounded areas of light and shade, when seen in tree shadows, often appear (if viewed from one side as is commonly the case) elliptical because of perspective foreshortening. This we illustrate at 2, Plate 65.

Both these types of ellipses which we have mentioned—one caused by general roundness of tree forms, and the other by diffraction—give the key to a great deal of foliage shadow representation. The artist finds that if he bases most of his foliage shadows on rounded shapes, somewhat like those at 2, his results will prove more successful than when many sharp, angular ones are introduced. This is as true on vertical or sloping planes as on those which are horizontal. Sketch 3 demonstrates this, though some of these shadows, especially at *B*, are too angular to serve as ideal illustrations of our point.

The above refers particularly to foliage. The shadow of the tree skeleton, or any portion of it, often looks much like the actual skeleton (see Plate 84, page 182), though its angles are usually rounded and its edges softened by diffraction. Here, again, reasonably correct foreshortening must be shown. Too many such shadows seem, through improper treatment, suspended in the air.

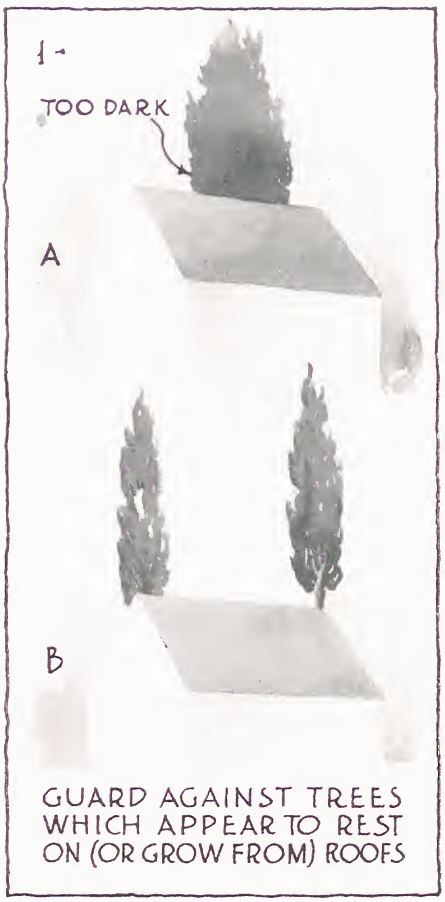
Tree shadows help to express the forms of the surfaces on which they fall. Note at *A*, Sketch 3, Plate 65, how the shadow, by turning up against the building, explains the change of plane, as does the shadow breaking across the corner at *B*. When shadows lie on walls, as here, many of the punctuating spots of light usually exhibit similarities in both shape and direction: we observe at *a* and *b* the directions which predominate in this sketch. In Sketch *C* the tree shadow, by breaking up over the curbstone, clearly reveals the change in level. See *a*. Sketch *D* illustrates the opposite condition, for here we are looking from the sidewalk towards the street. At *E* the shadow tells us the approximate pitch of the bank. See Plate 73 for further illustration of some of these points.

SHADOW EDGES If shadows fall on irregular surfaces, instead of on smooth lawns and walks such as we have shown, their character changes accordingly. In Sketch 4, at *A*, is an indication of foliage shadows on uncropped grass. The strokes used suggest grass as darkened by the shadow.

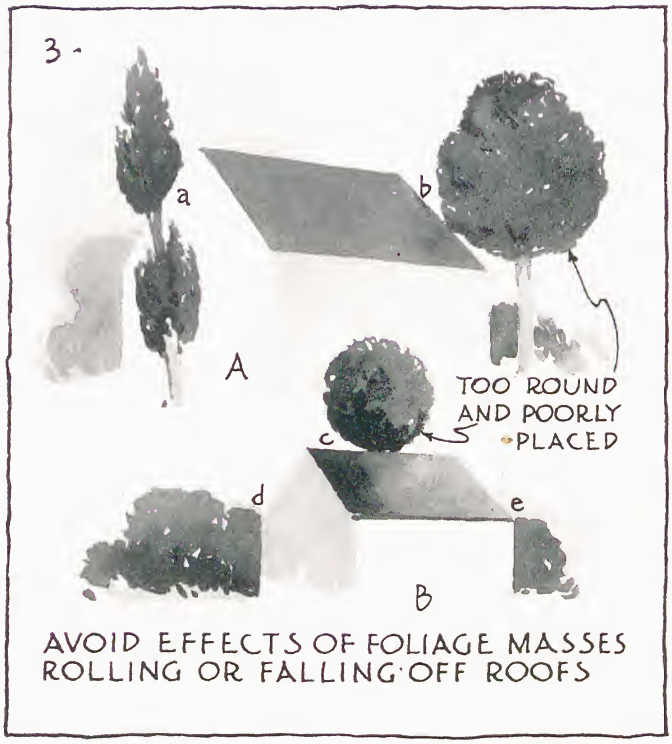
At *B* the shadow was painted with several distinct edges. Nature, through the same diffraction which causes the rounded light and shadow forms already discussed, often gives us an effect of parallel bands: in paintings it is common to merge them.

The sketch at *C* reminds us that bushes and other objects close to the ground cast shadows extremely definite in character of edge, the light rays being little refracted. The shapes of such shadows are often highly expressive of the objects casting them. Bushes frequently cast very dark shadows beneath them.

SUMMARY Though we are by no means through our discussion of trees, it seems advisable to pause for a word summarizing our instruction to this point. Don't fail to perform sufficient exercises to give you fair mastery over each of these vital factors: 1. Tree growth, with especial attention to the skeleton; 2. Tree contours, as expressed in simple silhouette; 3. Values, both of skeleton and foliage, representing local color and light and shade; 4. Tree shadows, with their edges; 5. Color, for though we have said little about it, many of the truths expressed above relate to color as directly as to black and white. It will be more fully treated in the following chapter, along with other vital considerations.



2 - DON'T "PARALLEL" ROOF LINES WITH EDGES OF FOLIAGE MASSES
- A -
AVOID SUCH OVER-CONSPICUOUS SHAPES
a' b' c' d' e'
a b c d e
- B -
DON'T "LINE UP" TREE TRUNKS OR MAIN BRANCHES WITH IMPORTANT LINES OF THE ARCHITECTURE



4 -
TOO COMPLEX
DO NOT COMPLICATE DISTANT MASSES OF FOLIAGE (OR UNIMPORTANT ONES NEARBY)
"SPECKLED" TREES ARE PARTICULARLY DISTRACTING (UNLESS IN THE FOREGROUND)

A SHEET OF WARNINGS BASED ON COMMON STUDENT FAILINGS

It is quite an art to relate trees and architecture advantageously

WATER COLOR BY JAMES PERRY WILSON, A CHURCH IN CONNECTICUT, BERTRAM GROSVENOR GOODHUE, ARCHITECT

This handling has splendid breadth despite the infinity of detail. Original, 29¼" x 21½"

WATER COLOR RENDERING BY J. FLOYD YEWELL OF A HOUSE BY EUGENE J. LANG, ARCHITECT

Through hue and value opposition brilliant sunshine has been developed. Original, 12" x 16"

FIRST PRIZE HOUSE BY COOKMAN CASS: WATER COLOR RENDERING BY J. FLOYD YEWELL

Especially notable is the treatment of trees, vines, and shrubbery. Original, 20¼" x 27½"

1 BUSHES OFFER EXCELLENT PRACTICE

FIRST STAGE (PENCILLED AND LIGHT TINT APPLIED) SECOND STAGE (SOME DARKER TONES ADDED) FINAL STAGE (SHADOWS AND ACCENTS COMPLETED)

2 BUSHES VARY GREATLY IN COLOR

FIRST STAGE (PENCILLED AND FIRST TINTS APPLIED) FINAL STAGE (SHADOWS AND ACCENTS COMPLETED) ANOTHER COLORING (NOTE TREES IN DISTANCE)

3 HEDGES SHOULD BE ATTEMPTED

FIRST STAGE (PENCILLED AND TINTED)

FINAL STAGE (NOTE DARK SHADOWS)

4 A SIMPLE COMPOSITION

COMBINING HEDGE, BUSHES AND TREES

FOLIAGE OFFERS GREATER VARIETY OF HUE THAN IS SOMETIMES REALIZED

The beginner too often paints it all in too "green" a green

1 THE "STIPPLE" METHOD (THE TONES "BUILT UP" OF MANY SMALL STROKES)

2 THE "DIRECT" METHOD (EACH PORTION DONE MAINLY IN ONE WASH)

3 TEXTURE OBTAINED MAINLY THROUGH PENCILLING

4 FLOWERS ARE USUALLY DONE SUGGESTIVELY

SOME COMPARATIVE METHODS OF INDICATING DETAIL

There is no one right way for such work: rather there are many ways

CHURCH AT NEW ROCHELLE, N. Y., RENDERED BY OTTO R. EGGERS FOR THE OFFICE OF JOHN RUSSELL POPE, ARCHITECTS

For a detail of this drawing at full size see the following plate. Original, 30" x 21"

DETAIL OF DRAWING BY OTTO R. EGGERS SHOWN ON PREVIOUS PLATE

Pencil tinted with water color as done here is popular for foliage representations. Original, this exact size

SHOPS BY ROGER H. BULLARD, ARCHITECT, AT YORK HARBOR, MAINE, RENDERED BY SCHELL LEWIS

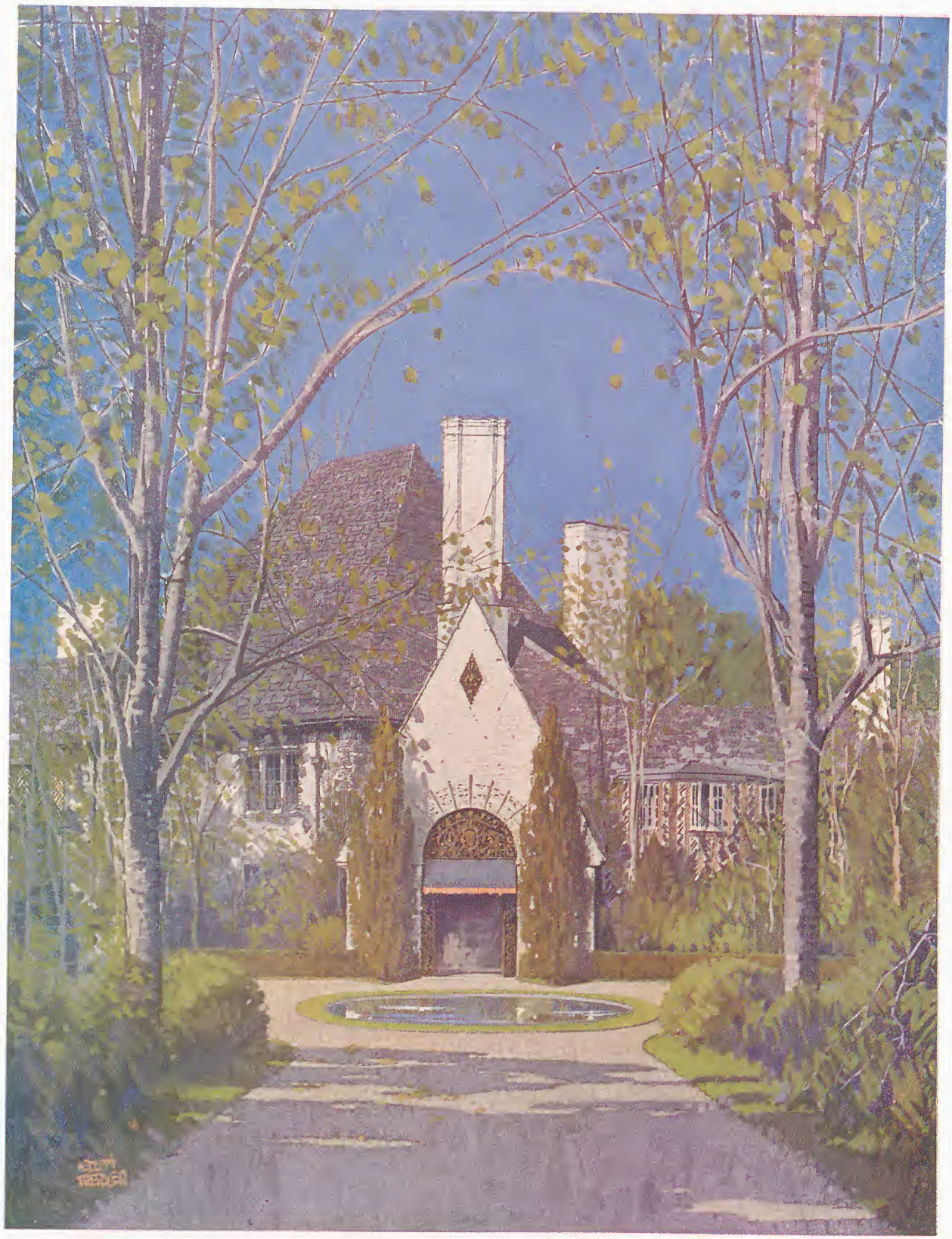
Study both the trees and their shadows with the utmost care. Note the detailed bush in the foreground. Original, 20" x 14"

BEAUVOIS, ST. JEAN DE BRAYE, LOIRET, FRANCE—WATER COLOR SKETCH BY PAUL P. CRET

Observe the effect of light shining through the foliage masses; also the breadth and simplicity of treatment. Original, 9½" x 6"

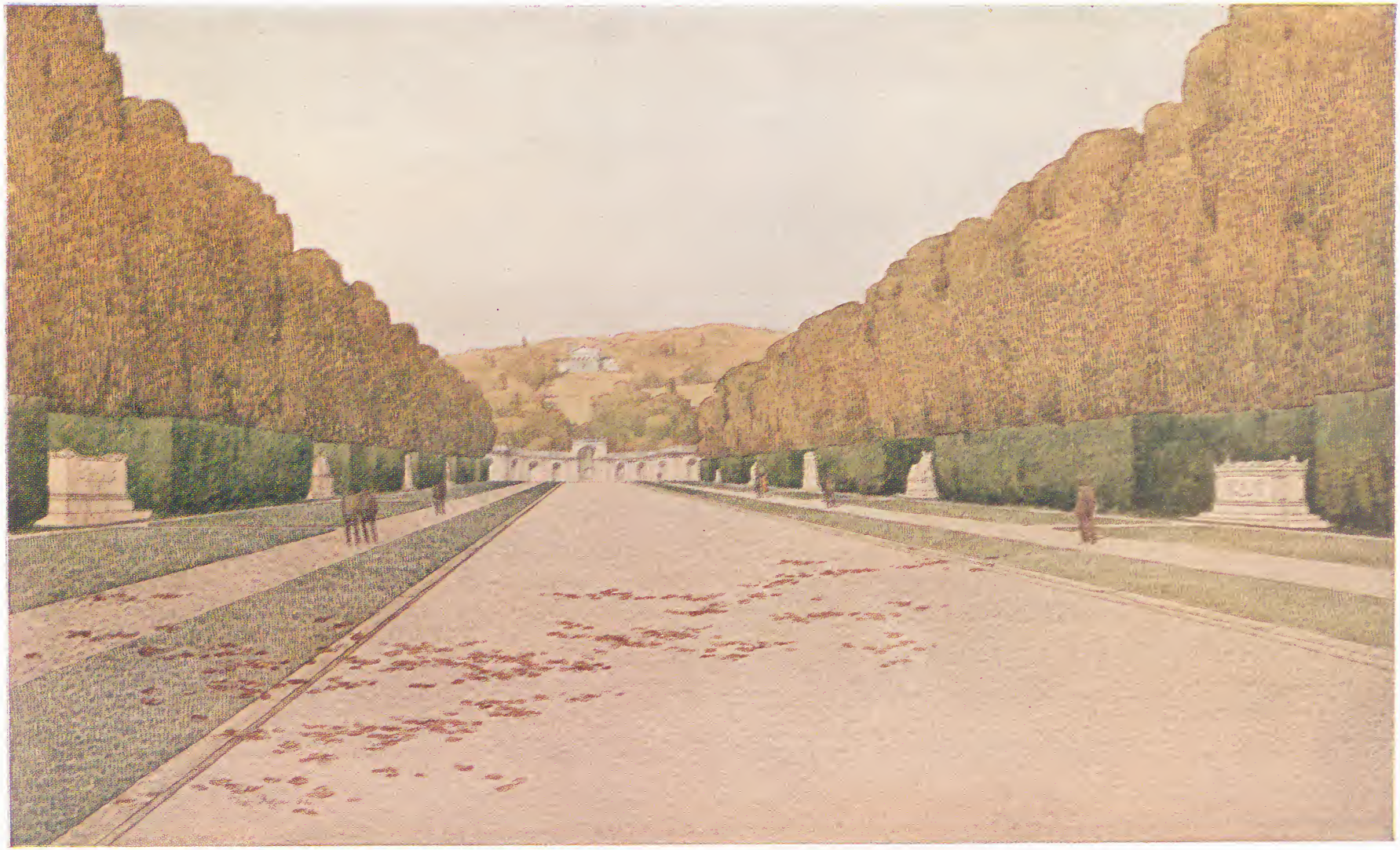
AUTUMN LANDSCAPE IN BURGUNDY AS SKETCHED BY CAMILLE ETIENNE GRAPIN

This clever impression of landscape was daringly executed with a free mingling and dabbing of many hues. Original, 12" x 9½"



RENDERING IN GOUACHE BY ADOLPH TREIDLER OF A HOUSE BY H. T. LINDEBERG

Opaque color is especially convenient for foliage representations. Original, 18" x 24"

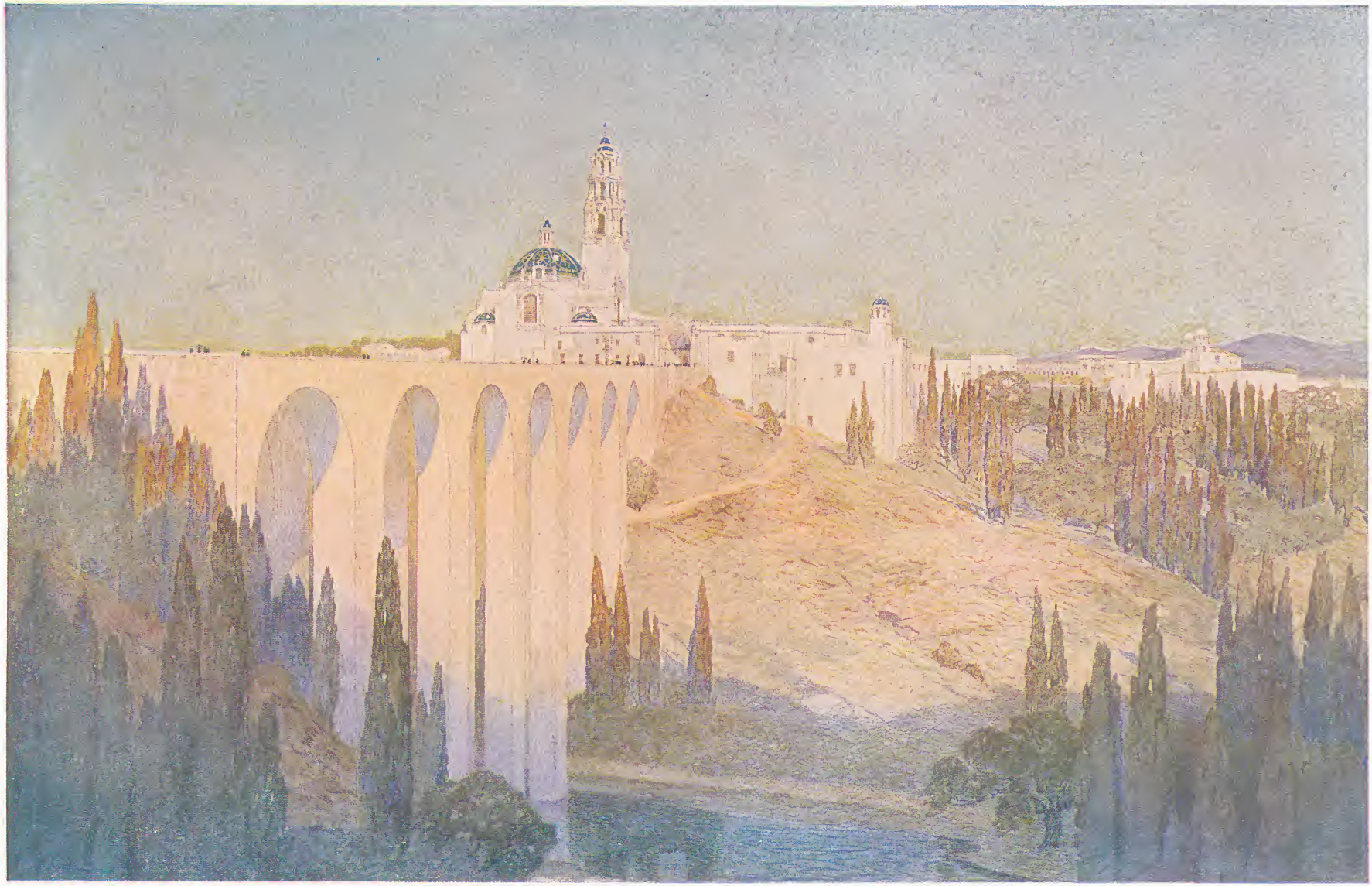


COLOR STUDY BY FRITZ STEFFENS FOR APPROACH TO ARLINGTON CEMETERY—McKIM, MEAD, AND WHITE, ARCHITECTS

Here the trees are treated as masses, rather than individually. The foreground leaves are well handled. Original, 22½" x 14"

PASTEL RENDERING BY THOMAS EWING KING FOR MILLS, RHINES, BELLMAN, AND NORDHOFF, ARCHITECTS

Here the trees and tree shadows have been handled with unusual success. Original, 23½" x 15½"



RENDERING OF SAN DIEGO EXPOSITION MADE FOR BERTRAM G. GOODHUE BY BIRCH BURDETTE LONG

Observe in particular the foreground trees in shadow as contrasted with the more distant ones in sunshine. Original, 83" x 47⅜"

A CHURCH IN MEXICO SKETCHED IN WATER COLOR BY CARROLL BILL

Here the trees are few but important in giving strength and character to the composition. Original, 19¾" x 13"

FROM A DRAWING IN PEN AND INK AND WATER COLOR BY BIRCH BURDETTE LONG

Endless effects are possible when pen work, either black or colored, is combined with transparent and opaque water color. Original, 12" x 8¼"

CHAPTER XXI

MORE ABOUT TREE REPRESENTATION

INCLUDING COMMENTS ON SOME TYPICAL PAINTINGS

Continuing our discussion from the previous chapter, we next turn to some of our colored examples. These not only show how different artists express trees, but demonstrate some uses they make of them.

First we have, in James Perry Wilson's skilful treatment, Plate 66, some representations of an extremely naturalistic nature, showing tree skeletons as they appear in winter under subdued lighting. These are honest studies: the student would profit greatly by trying equally painstaking ones of his own. Note the variety and consistency of growth—see how the skeleton members decrease in size gradually from trunks to upper branches until the smallest of the latter merge into solid tone. Observe, too, the subtlety of the coloring. It is well to compare this with the other church renderings, Part II.

In strong contrast with this handling, but with emphasis still on anatomy, is the foreground tree in the vigorous rendering by J. Floyd Yewell, Plate 67. Almost barren of leaves, and dark in value, this acts as a sort of parenthesis mark to frame the subject beyond and give distance to it. In order to provide the desired contrast, and to show that the tree itself is mainly in shadow, the artist has depended largely on cool colors for both the tree and its shadow (as well as for the foreground bushes, indistinct in the shadow below). Note that the trees beyond the house have been made brilliant. It is very common practice thus to contrast foreground and background masses. Here the house, with its vines, and the trees behind it, together with the lawn (note that the grass is pure yellow) and neighboring sky, forms a bright central unit almost surrounded by darks. This type of composition has wonderful possibilities, as this rendering so well testifies.

In the following example (Plate 68) by the same artist, the entire sheet grades, in a sense, from light at the top to dark at the base, another not infrequent scheme of composition. Here the skeletons of the two large elms are in sunshine, and so were treated in warm colors. They are convincingly constructed. The yellow foliage produces a strikingly sunny effect: it was rendered mainly by means of juxtaposed or interrun strokes. The adequate impression obtained in both skeletons and foliage by economical means is quite remarkable. It is interesting to compare these trees with those in still another drawing by Yewell, reproduced as Plates 131 and 132, pages 264 and 265, for such comparison shows us how much variety of treatment an artist often feels called upon to use.

EXERCISE 55: BUSHES Now let us turn once more to bush representation: see Plate 69. Make, in full color, a few sketches similar to these. Outline each bush, as at *A*, Sketch 1, and apply a light tint of color. Wash in your sky and grass. Add a few darker tones for shade, as at *B*, taking into account the direction of the light. Deepen these and add accents, as at *C*, thus gaining roundness and stability. Don't confine your efforts to bushes of one shape or color. Note that the evergreen shrub at 2 (*B*) was done with blue-green, the small bush and lawn with yellow-green, and the large bush with dull orange and red. Sketch *C* shows still another hue arrangement—one which gives particular emphasis to expression of distance. See how the tones on the evergreen grade, the top coming up into the light. The little areas of bare paper in this sketch add to its freshness.

EXERCISE 56: HEDGES As another type of detail simple enough for early efforts, we have hedges. Sketch 3 pictures, in two stages, a hedge handling; the method was the same as in the previous examples. Representations of this sort are often disappointing until the final dark accents are applied. Sketch 4 brings into one composition a variety of landscape features. Note that in the distance a number of very pale colors were used; much the same hues, in greater strength, were brought into

SKETCH OF A GARDEN, DRAWN IN PASTEL BY MISS L. C. HUNTER FOR VITALE AND GEIFFERT

Pastel is a splendid medium for flower interpretations. Original, 12" x 16"

A GARDEN RENDERED IN PASTEL BY J. FLOYD YEWELL. ANNETTE HOYT FLANDERS, LANDSCAPE ARCHITECT

Again we see the adaptability of pastel to trees and flowers. Original, 25" x 18"

the foreground. The violet shadows forming the base of the whole add to the feeling of sunlight. Try some sketches of this general type, preferably from real places.

As supplements to these hedge representations, see Yewell's treatment on Plate 68.

FOLIAGE METHODS There are several methods of going about the painting of foliage. The most common of these is the one just described; this we might call "progressive." The three studies of one subject by the author, Plates 127, 128, and 129, pages 260, 261, and 262, further illustrate this.

In a second method, shown at 1, Plate 70 (and known as "pointillistic" or "stipple") a pale foundation wash is usually laid, as before. This is next gone over with tiny brush strokes, placed in juxtaposition (*A*). When dry, this stippling is continued (*B*), forms being gradually modeled until completed (*C*). The large trees in Mr. Yewell's drawing, Plate 68, show what might be called the first stage of this process, yellow brush marks having been juxtaposed over a light undertone. The large trees in this same artist's rendering, Plate 131, page 264, exhibit an extension of this same process. In these examples by Yewell the brush marks are perhaps too coarse to be called stipple, though the method is exactly the same.

A third method, not unlike the first in results, can be called "direct," for the artist, instead of working over each area until it is built up to a satisfactory point, lays his color with the utmost economy of means. Many times he puddles an area with green, and while it is still wet drops darker pigment in for the shade tone, thus obtaining his effect in a single process. More often, a few final accents are necessary. This method is speedy, but can be learned only through long practice. The sketches at 2, Plate 70, were done by this method, though in reduction they appear to be more worked over than they actually were.

It is always something of a problem to know how to represent leafage without using so many tiny brush strokes that the effect appears labored. One method is shown at 3, Plate 70, where, in the several small examples, irregular lines like that in the upper right-hand corner were first applied with pencil. A sanguine (reddish) pencil was used at *B* and *C*. Sometimes individual leaves are penciled: see the author's drawing, Plate 127, page 260; also the foreground bush in the Yewell subject, Plate 131. Examination of other colored plates will prove that the pen is occasionally employed in place of the pencil (see Plate 81), as is charcoal, sprayed with fixatif.

EXERCISE 57 Try these various methods, and such others as occur to you.

TINTED PENCIL DRAWINGS While we have this matter before us, let us look at a type of work in which the penciling takes precedent over the water color. This is exemplified in Plates 71, 72, and 73, which, strictly speaking, are not water colors, but tinted pencil drawings. We include them mainly for the benefit of our architectural reader, this sort of work being looked upon with particular favor by architects, as it lends itself admirably to their needs.

The example reproduced as Plates 71 and 72 is from the hand of the renowned architect-renderer Otto R. Eggers. Fortunately we are able to publish his method (and palette) in his own words, as follows:

"My recent work has been more in the nature of pencil drawings with a light wash of color laid over. I have adopted this method because of the speed and lack of effort involved for a purely architectural presentation.

"The drawings are invariably rendered in pencil on thin paper laid over a roughly drawn line perspective. The thin paper drawing is then mounted on gray cardboard and the color laid on, sometimes clear, and more often mixed with Chinese white. Inasmuch as the color is usually applied only to that portion of the picture in sunshine, the colors used are mostly the yellows, as follows:—

Chrome yellow
Lemon yellow, usually for grass
Cadmium orange with Chinese white, for concentrated sunshine
Cadmium orange, clear, for foliage
Chrome orange, for reflected light, tree trunks, or brickwork
Brown pink, for foliage
Warm sepia, and sometimes green, sparingly used

"The general principle is that the yellow and orange with the natural color of the pencil and the gray background simulate the three primary colors."

This subject required so much reduction in Plate 71 that we have reproduced a portion at full size, Plate 72. This reveals the completeness and accuracy of the beautiful pencil work. It is the trees, bushes, and vines that particularly interest us at the moment, and

these should be studied with the greatest care as they are splendidly handled. One should not overlook their shadows on the ground and buildings. We comment on this drawing from an architectural viewpoint in Part II.

Plate 73 is from the hand of another noted renderer, Schell Lewis. Like Eggers, he made his drawing on mounted tracing paper, but his mount was white, rather than tinted. (For his method of mounting, see page 18.) He has obtained a very rich effect by comparatively simple means. The trees are splendid. Particularly interesting is the shadow of the large tree where it breaks across the building. The shrub in the foreground, with some of the leaves individually drawn, is worthy of attention. More is said about this drawing on page 224. The reader interested in further examples of this tinted work should refer to Chapters VII and VIII, Part II.

Turning again to typical water color, let us examine the simple, restrained sketch by Paul P. Cret, Plate 74. Here the handling is very broad, and the effect of sunshine and shadow is expressed with commendable economy of means. Nothing is overworked, yet there is ample variety both in value and hue. The roughness of the paper gives sufficient indication of texture. Particularly successful is the effect, in the foliage, of sunlight shining through the translucent leaves from behind. It will be noted, incidentally, that the foliage of some of the trees merges; they have not been treated as individual things. The indication of grass and earth, together with the tree shadows, is very convincing. The lighting is interesting, the rays slanting towards the spectator from in front (at the left), rather than from over his shoulder as in most of our previous examples. The whole, in short, is a most capably managed drawn-on-the-spot effort.

No less delightful, though perhaps harder for the beginner to appreciate, because of its rather impressionistic character, is the landscape by Camille Etienne Grapin, Plate 75. This was also honestly done outdoors, and conveys, despite the somewhat indefinite expression of form, an admirable feeling of autumn. Especially notable is the free and harmonious use of color. This was applied with a very full brush and worked wet, somewhat after the fashion of the minglings described in Chapter XII, with the result that there is scarcely a square half-inch without variety. The textural quality results partly from the eggshell paper.

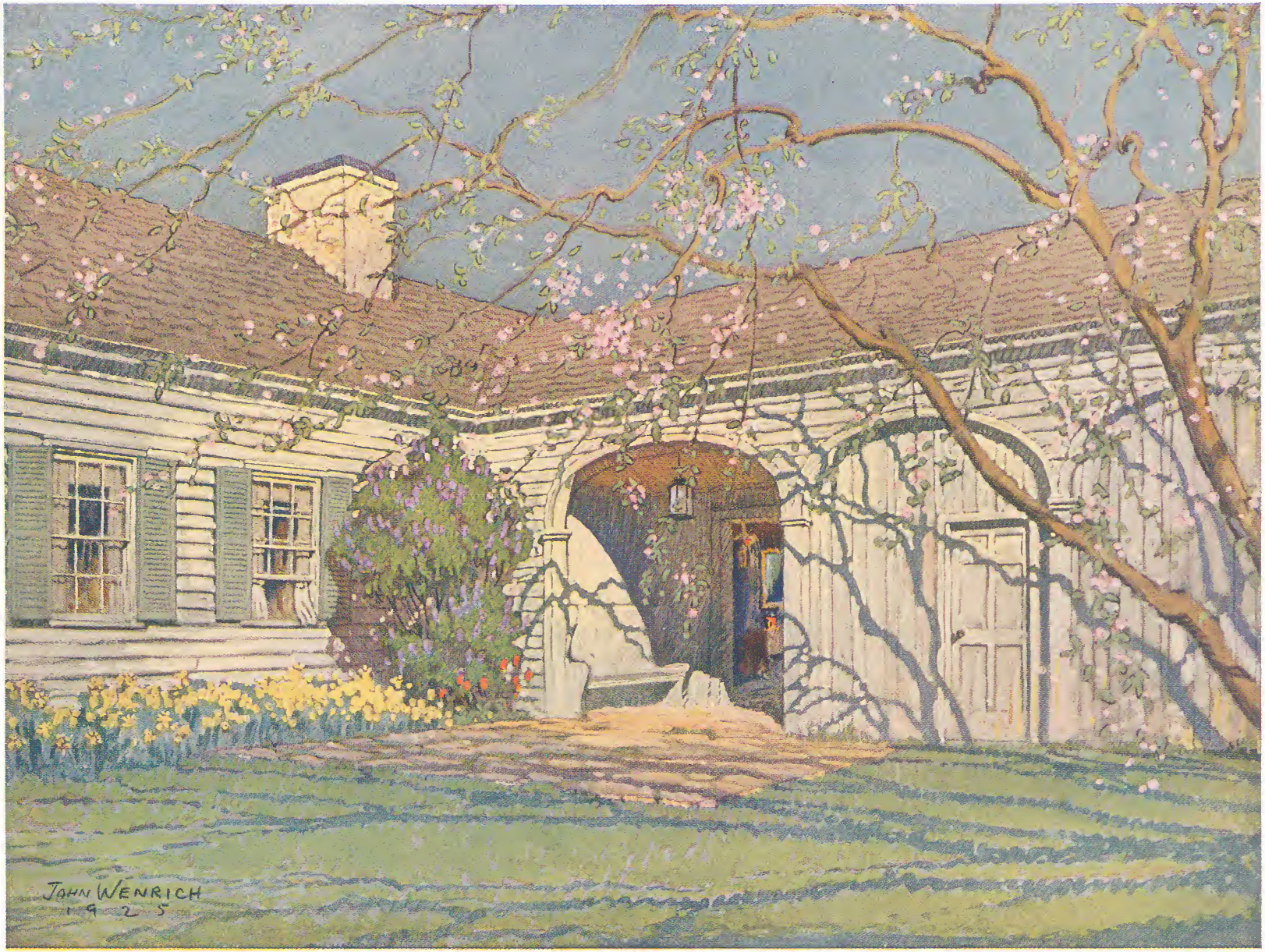
From the indefinite we now turn to the definite in Adolph Triedler's gouache drawing, Plate 76. Opaque paints, oils, and pastels have one advantage over transparent water color in tree representation, in that they permit one to paint trees on top the sky—or any background, for that matter—after it is finished. It is easy to see in this study how this famous artist has "laid on" the nearer leaves of the larger trees after the trunks and branches were completed. Note the decorative manner in which these light green strokes have everywhere been arranged, yet without detriment to the naturalistic character. See Chapter XXVII for further information on opaque work.

Fritz Steffens, in his landscape subject, Plate 77, has treated his trees collectively, rather than individually. His technical method was interesting. The original was drawn on tracing paper in pencil (over a preliminary layout) and floated on to a rough cardboard. The rendering was done with a five-color palette and each of the washes contains all five of these colors in varying proportions. Observe the texture created by the vertical line work: note, also, the foreground leaves which break up the large horizontal expanse.

TREE COMPOSITION The composition of tree masses in relation to other subject matter is a thing of the utmost importance. Many artists who paint individual trees well (together with shrubs, grass, and the like), stick them around rather awkwardly when it comes to work demanding the slightest degree of creative ability. The architectural renderer, in particular, though he customarily handles his buildings with exceptional skill, is often criticised because his natural surroundings don't fit. Plate 78, by Thomas Ewing King, is presented at this time because it shows a discriminating treatment in this respect. For further comments, turn to Chapter XXVII.

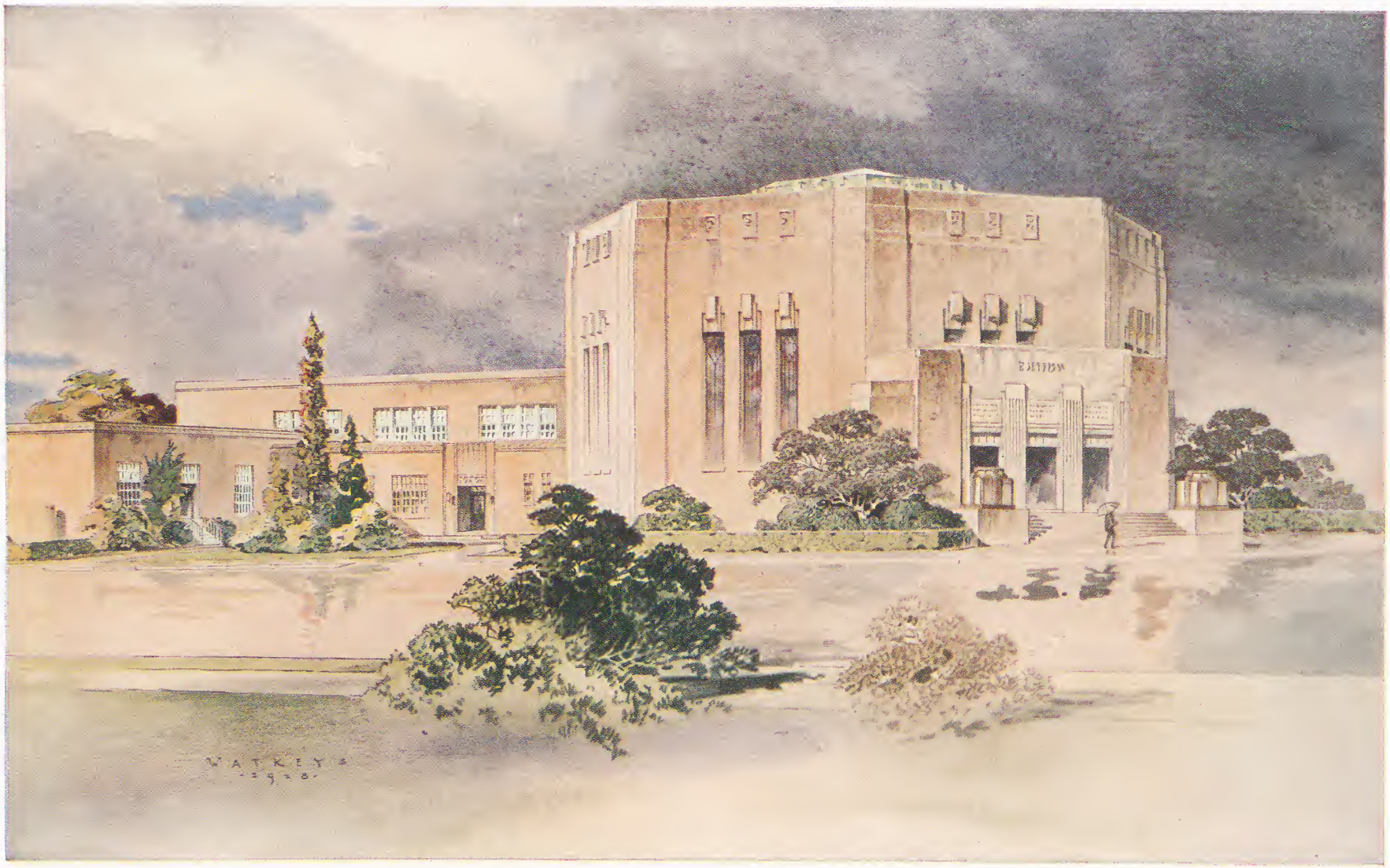
This is a pastel drawing, incidentally, this medium permitting one to obtain with the greatest of ease such contrasts of value and hue as are shown here in the nearby and distant trees. It also makes possible, with a minimum of effort, soft shadow edges like those in the shadows of the foreground.

As another masterly example in which trees form a very important part in the composition, we have the rendering by Birch Burdette



OLD HOUSE NEAR EAST AVON, NEW YORK, RENDERED IN TRANSPARENT AND OPAQUE COLOR BY JOHN C. WENRICH

In opaque work, flowers can be added the last thing. Note here the interesting tree shadows. Original, 17" x 13"



TEMPLE EMANUEL, PATERSON, N. J., F. W. WENTWORTH, ARCHITECT. WATER COLOR DRAWING BY PAUL F. WATKEYS

The sky gives contrasts to throw the building into relief. Original, 25½" x 16½"

Long, Plate 79. Now and then it is necessary to group pointed trees such as cypresses or poplars. They often cause difficulty, for it is not easy to keep them properly suppressed. Though Long employed many separate trees here, he used such rare skill in grouping and treating them that they hold their places extremely well, making an excellent setting for the architecture instead of detracting from it. They not only form a sort of surrounding frame, but contribute shapes harmonious with the towers, archways, and other architectural features. The contrasts of hue and value in the trees in sunshine and shadow should be observed, as well as the ethereal quality of the entire subject—its feeling of distance and airiness.

Chesley Bonestell's rendering, Plate 88, page 190, is still another in which trees are combined to play an important part, though here we have greater variety in their form, value, and hue. Note that the background trees are managed as a solid mass, the squarish tops against the sky harmonizing nicely with the lines of the subject and level site. The foreground trees and lawn are treated simply yet expressively. The rich and closely related colors register remarkably well the mood of the hour. As to method, this painting was executed in a rather unique way. Instead of paper, an absorbent fine-grained canvas similar to shade cloth was selected. After the proportions were laid out in pencil, the principal areas were washed in with water color, thus giving the texture visible in the path and grass and the trees of the background. Then glazes of oil were used to heighten the color and even the tone. The sky was added with pure oil paint.

While on this matter of the composition of tree masses, the reader should find the pointers on tree cutouts, Chapter V, Part II, of value.

TREES IN RENDERING Though much that we have said in this chapter relates to rendering as well as to sketching, we shall offer additional comments on tree representation in discussing the individual renderings in Part II. This seems the best point, however, to touch on one or two thoughts relating to trees in connection with buildings—some tips on what not to do—which, though of primary interest to the renderer, are of general application.

At *A*, Sketch 1, Plate 65A, we illustrate a fault found in many drawings. Here the tree is graded so dark as it goes behind the ridge that it gives something the impression of resting on it, if not actually leaning forward. It should be lighter at the ridge or less definite. At *B* the two trees, or at least that at the right, seem to grow from the roof. If trees are actually behind buildings, care should be taken to subordinate them to make them appear so.

At *A*, Sketch 2, another fault sometimes found in architectural paintings is pictured: here the edges of the foliage masses seem too nearly parallel with the roof lines, thereby becoming unpleasantly conspicuous. At *B* is still another fault; the tree shapes not only detract from the architecture, because of their moth-eaten character, but they are so disposed that some of the principal lines of trunks and branches extend the lines of the architecture unnaturally. See *a*, *a'*; *b*, *b'*; etc.

Sketch 3 shows additional faults sometimes found in sketches and renderings, while Sketch 4 holds a word or two of well-intended advice.

ADDITIONAL EXAMPLES It is impractical to call attention to more than these few of the many fine tree representations in our volume, so we urge the reader to turn the pages for himself, studying with a critical eye every example which he discovers.

CHAPTER XXII

A WORD ON THE GARDEN AND LAWN

BRIEF CONSIDERATIONS OF FLOWERS AND GRASS

We shall devote no space to flower painting as a subject in itself, since there are no new principles involved, yet a book placing emphasis on architecture and outdoor subjects would be incomplete if it failed to touch on the suggestion of such groups of flowers as are common to the building environment.

Let us turn back to Plate 70, page 165, where at 4 is presented, in three progressive stages, a method of building up an indication of informal floral masses. As a rule such indications, if they are to exhibit the sparkle and brilliancy customarily desired, are done directly on the white paper, with no underlying washes (unless very pale). First the bright touches are applied, many flowers being merged into groups (*A*); there is often a tendency to make them too dark in value. Little whites are left among them to add life. If one's pigments are not sufficiently vivid, special pigments, as mentioned on page 2, should be provided. Next, washes indicative of the surrounding grass, bushes, etc., are brought approximately to the flower areas, as at *B*. Shade, shadow, and a few accents finish the whole (*C*). The same general method was used in the author's drawings, Plates 127, 128, and 129, as well as in some of the residence renderings in Chapter V, Part II.

A particularly interesting, though scarcely typical, treatment was employed in Birch Burdette Long's garden rendering, Plate 81. Pen lines in waterproof black ink were first used to emphasize many individual forms, after which practically flat tints of transparent water color were applied. A few dabs of opaque were added to some of the flowers, pen and ink being turned to again for final accents.

Those familiar with Long's later work alone would scarcely recognize this drawing as from his hand. It was done in 1900, and is typical of a technique he favored at that time.

As another fine example of the treatment of a garden, we refer to the energetic, but softly harmonious sketch by Miss L. C. Hunter, Plate 82. This, again, is not a water color, having been done in pastel. Neither is it an outdoor sketch, for it was made as a presentation drawing to show the client of a landscape architect an effect that could be obtained through a preconceived planting arrangement. The paper was of a light cream tint. The pastel was left in place just as it came from the crayon, with no rubbing. This drawing stands as a splendid illustration of aerial perspective: note how the eye is carried back by easy degrees from the delightful floral group in the foreground to the distance. Observe, also, the rich beauty of the color scheme. Though much this same general effect could be arrived at with water color, it should be remembered that it is a perverted idea to try to make work in one medium look exactly like that in another.

Quite similar, yet enough different to make its inclusion well worth while, is the garden subject by J. Floyd Yewell, Plate 83. Again the medium is pastel. The drawing was made on a kid-finish pastel-surface board, the general masses being put in with soft grain pastels, with harder ones selected for the small detail of the architecture and flowers. The drawing was sprayed with fixatif when half finished and again when completed. For further information on pastel, see Chapter XXVII.

As a less formal treatment involving the use of flowers, we now offer John Wenrich's painting of an old house, Plate 84. This was first drawn on light brownish cardboard in black crayon. The shadows were then washed in with transparent color, after which the sunlit portions and the sky were rendered in opaque. Opaque color, laid on thick enough to obliterate the tones beneath, served perfectly for the scattered blossoms on the tree, lilac bush, etc.

GRASS There is little that need be added to our earlier scattered remarks on the treatment of grass. Like other subjects, everything depends on its character and the conditions under which it is seen. The beginner's common mistake in rendering smooth lawns is that he

THE POETS' CORNER, WESTMINSTER ABBEY. WATER COLOR BY HUGHSON HAWLEY

This artist has become noted for his naturalistic sky treatments. Original, 23" x 30"

WATER COLOR BY SAMUEL CHAMBERLAIN—A STREET IN SENLIS

Note that the sky has been kept in good scale with the rest of the composition. Original, 15" x 22"

employs too dark and cool a green. Grass in sunlight is generally yellow-green in effect, and sometimes practically pure yellow. Its value is light. So, for sunny lawns, a flat or graded wash of yellow-green is often all that is needed, particularly if the paper is rough or the wash a sediment one. If this looks too unfinished it can be stippled, in whole or part, with little upright strokes, or gone over with a second wash containing many small breaks to allow the first color to show through. The sandpaper trick may prove useful, too.

Shadows on grass must be carefully treated, as discussed in Chapter XX. All too often grass in shadow is mistakenly rendered so differently from that in sunshine that it scarcely seems the same thing. A bit of nature sketching is of great help here. Some sketches should be done facing the light, and some with it behind the back. Close scrutiny will prove that a patch of grass, such as a lawn, has many hues. First, each blade reveals different effects of green, as brought out by the light, shade, and shadow. If one faces the light, it will show through some blades, causing a most intense yellow-green. Again, blades are so tipped that their shiny surfaces reflect the sky, introducing miniature areas of luminous blue. It is astonishing to find that even a large area of grass, in the right light, can be modified in hue to quite an extent by these sky reflections. Then, in addition to these diversified effects of the green blades, we have equally varied dead blades, weeds, and the like, each playing its own small part in the impression of the whole. So a book is of little use here: the student must get into the open and observe such things closely, painting them over and over.

In John Wenrich's accompanying example we have a logical lawn treatment in opaque color: observe the way in which the tree shadow has been managed in a darker, cooler green. For other illustrations of grass (some of them of a rough, uncropped type), turn through our pages; study in particular the plates in Chapters IV and V, Part II.

While conducting this search, note also vines and like accessories. They require no new instruction.

EXERCISES Though we highly recommend that the student undertake studies of all these subjects from nature, there seems no point in numbered experiments. He should plan an orderly series of projects, painting flowers, grass, hedges, walks, gateways, and other such subjects, as seen at all seasons of the year and under diverse lighting conditions. Later such outdoor studies, no matter how crude, can be utilized, customarily in simplified and conventionalized form, in studio paintings.

CHAPTER XXIII

POINTERS ON SKIES AND CLOUDS

MIXING SOME INSTRUCTIONS WITH SOME EXAMPLES

We have often spoken of the fact that the artist can at best produce only inadequate and incomplete representations of many of the things which nature shows him, being constantly forced to suggest or interpret. This is particularly true of skies. It is impossible to paint them as we see them. Even the clear, cloudless sky has qualities which baffle us. Not only is it often brilliant and luminous to a degree fairly dazzling but it has a vague, indeterminate character, great depth and transparency, and an indescribable quality of scintillation. Cloudy skies add to our problems, for there are clouds of many types, exhibiting all sorts of shapes, values, hues, and kinds of edge. And none of these are constant: clouds form, move, reform, and perhaps disappear before our very eyes, and often with bewildering rapidity. And then come sunrises and sunsets and moonlight! Try these if you would know your limitations.

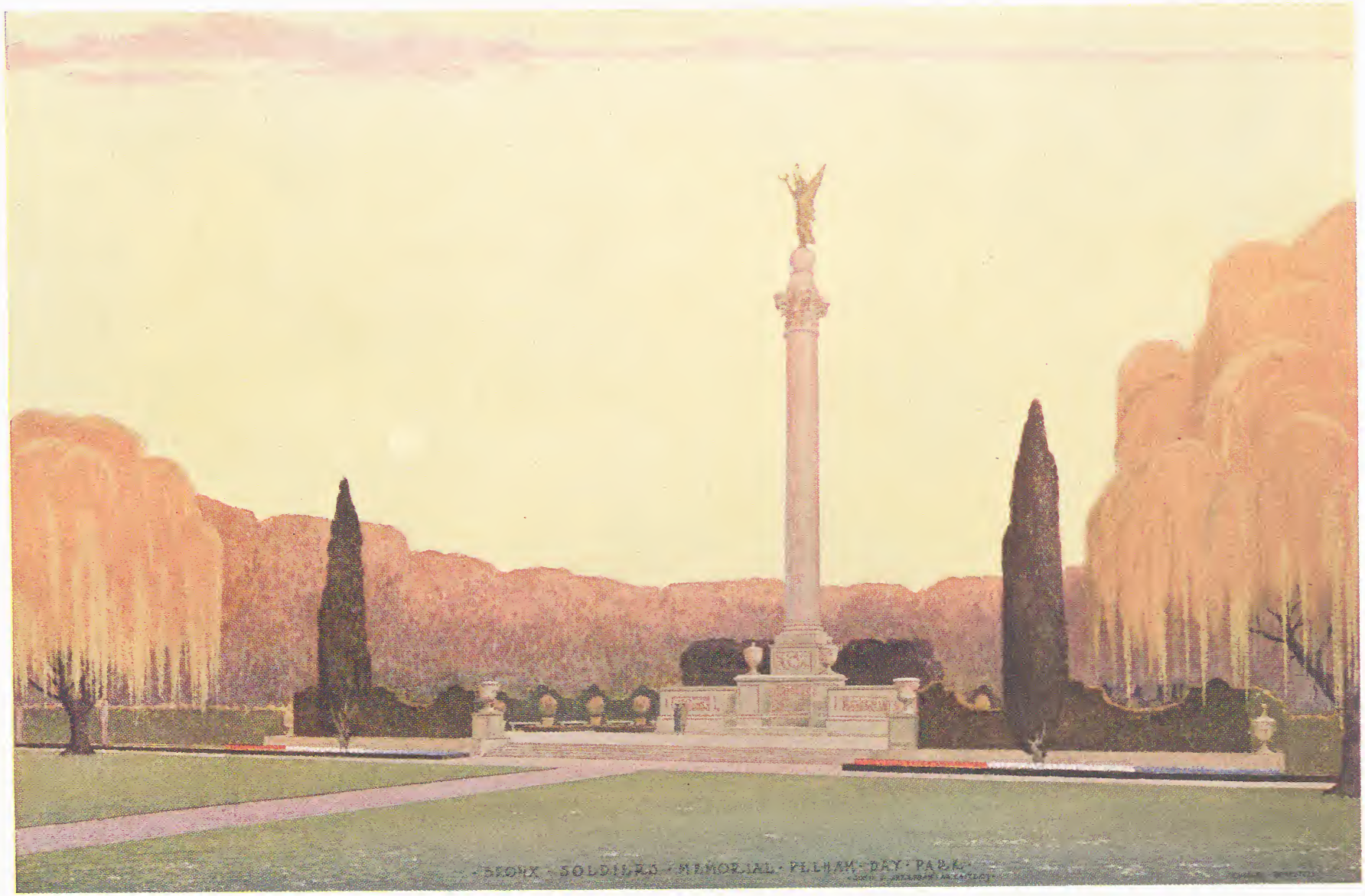
Paradoxically, this need worry the beginner but little, for the human eye seems quite well satisfied with even such interpretations as he is soon able to offer. If he has learned to run flat and graded washes with a fair degree of skill, he can produce reasonably good effects of cloudless skies right at the start. His greatest fault, perhaps, is that his washes often show conspicuous blemishes. Again, his skies appear to be solid, vertical objects, like back drops for a stage. A sky is far from solid, and if we think of it as having definite form at all, it is domical rather than flat, giving the impression of starting way below the horizon, curving upward to the zenith and thence out of sight. One soon learns which of his pigments and papers are best suited to obtaining this effect.

CLOUDLESS SKIES It is doubtless better, at first, to hold to such simple skies as we have in Bailey's sketch, Plate 49, page 132, or in that by Haffner, Plate 51, than to paint the terrible clouds which so often ruin the beginner's early work. Some of these appear to be cut from paper or made from wads of cotton; others look like huge balls or eggs. Some seem solid and heavy like stones. Obviously, even the darkest cloud, to be successful, should be so represented that the spectator feels that a solid object, such as an airplane, could easily pass through it.

Skies, especially towards the horizon, are seldom as blue as the beginner believes. Not only are they comparatively light but they vary decidedly in color; sometimes they are greenish, yellowish, or pinkish; again they lean towards violet or red. Approaching the zenith they show somewhat less diversity because of the relatively purer atmosphere, yet even here one finds great differences. That artists are cognizant of this fact is evident to one who turns our pages.

If only the portion of a sky towards the horizon is shown, it need by no means be graded. Nothing inconsistent is seen in the flatness of tone in the rendering by Frederick R. Witton, Plate 141, or that by Chesley Bonestell, Plate 88. If one includes larger areas of sky, however, it is almost invariably better to attempt to express, through grades, a dome-like form. J. Floyd Yewell's rendering, Plate 154, displays very effectively the change in both value and hue which nature so often shows, as does the sketch by Carroll Bill, page 175. Occasionally one imitates a somewhat less common aspect of nature, making the sky light towards the zenith and darker below, as Freeman has done on Plate 158. So varied are nature's effects, in fact, that one soon learns to select the one best suited to his particular purpose.

TEXTURE Artists have long sought means of interpreting something of the atmospheric scintillation or vibration of skies, which a perfectly plain wash, no matter how clear and smooth, fails to suggest. H. Raymond Bishop, for instance, has used in Plate 15, page 68, a sediment wash, while in his opaque color rendering, Plate 19, he has carefully stippled the



BRONX SOLDIERS' MEMORIAL, NEW YORK, RENDERED IN OIL AND WATER COLOR BY CHESLEY BONESTELL FOR JOHN J. SHERIDAN, ARCHITECT

Skies which are plain, or nearly so, are often effective: note the hue of this one. Original, 30" x 20"

1 COLORS DROPPED INTO PUDDLE

ALMOST ENDLESS EFFECTS ARE OBTAINABLE BY THIS METHOD

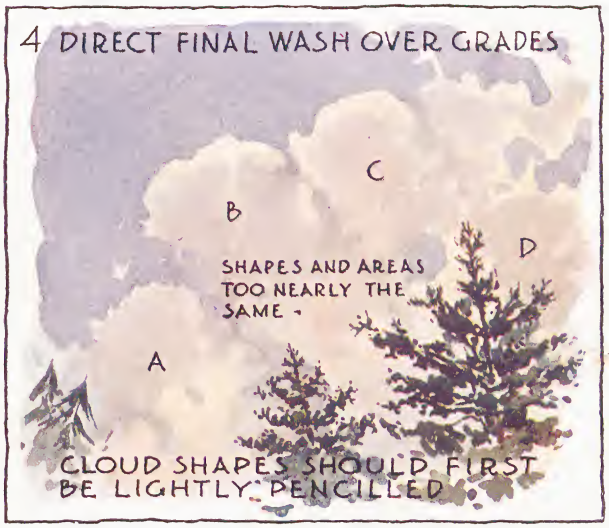
2 SIMPLE GRADES ARE EFFECTIVE

THE CLOUDS WERE ERASED AFTER THE WASHES WERE DRY

3 AN EXAMPLE OF DIRECT HANDLING

SPEED IS ESSENTIAL ONCE WORK OF THIS NATURE IS BEGUN

4 DIRECT FINAL WASH OVER GRADES



CLOUD SHAPES SHOULD FIRST BE LIGHTLY PENCILLED

5 STIPPLED WORK IS POPULAR

ONE HAS EXCELLENT CONTROL OVER THIS METHOD

6 OPAQUE PIGMENT IS USEFUL

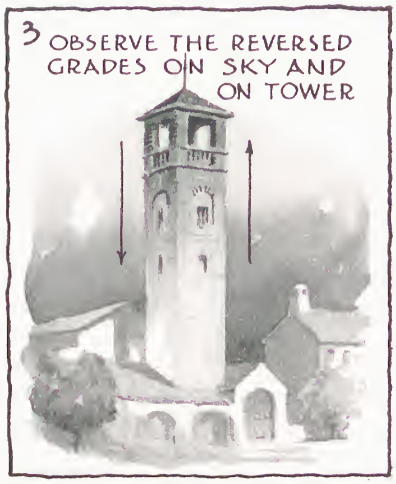
TINTED CHINESE WHITE APPLIED OVER FOUNDATION WASHES

A GROUP OF COMPARATIVE CLOUD INTERPRETATIONS

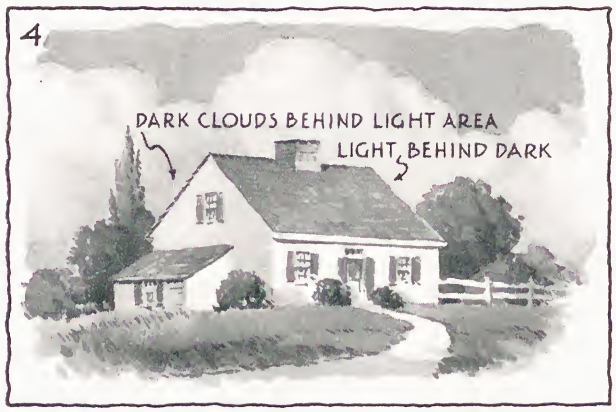
Clouds are never still. Rapid painting helps to catch the spirit of motion

LIGHT CLOUDS FORM EFFECTIVE BACKGROUNDS FOR DARK BUILDINGS

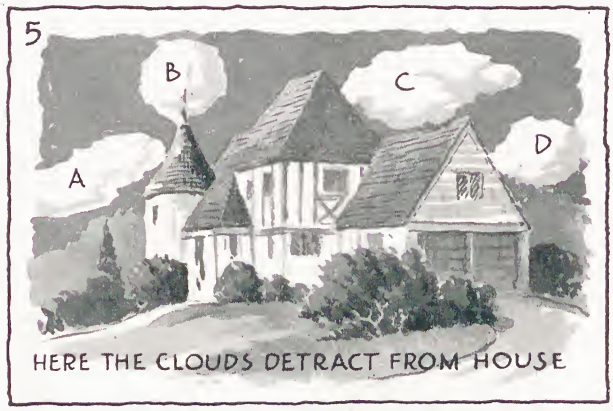
LIGHT BUILDINGS ARE BETTER AGAINST DARK SKIES, CLEAR OR CLOUDY



SKIES MAY BE GRADED TO GIVE CONTRASTS WHEREVER DESIRED



THERE ARE ENDLESS APPLICATIONS OF CLOUDS AS A MEANS OF OBTAINING CONTRAST OR INCREASED INTEREST



CLOUDS SHOULD NOT BE TOO ROUND OR SO PLACED AS TO APPEAR TO BE ROLLING OR SLIDING FROM ROOFS

CARE SHOULD BE EXERCISED NOT TO "PARALLEL" ROOF LINES WITH CLOUD EDGES IN AN OBVIOUS WAY

EVEN CLOUD SHADOWS ARE NOW AND THEN VALUABLE FOR BREAKING UP LARGE OR UNINTERESTING SURFACES

SOME "DO'S" AND "DON'T'S" ON SKY COMPOSITION

The capable artist makes skies his humble servants

entire surface. Other types of stipple are common throughout our pages. Even in pastel we find like attempts—see Francis Keally's study, page 285. The drawing by Alfred T. Granger, page 313, shows a sprayed sky.

Successful as sediment washes, stippling and the like often are, not only in catching something of the atmospheric spirit desired, but also in leading interest into otherwise barren portions of compositions, it is extremely easy to develop such over-conspicuous textures that they make skies seem painty things near at hand, the intended purpose being defeated.

EXERCISE 58 To clinch some of these points, make a number of little sky studies showing various textures.

EXERCISE 59: CLOUDY SKIES The best way to gain mastery over cloudy skies is by painting them over and over direct from nature. One can advantageously scrutinize paintings by other artists, too, perhaps copying particularly effective bits here and there. Possibly the easiest type, contrary to general belief, is that suggested at 1, Plate 89, for this is nothing but a mingling of colors dropped onto moist paper and allowed to spread, as discussed in Chapter XII. This was done with French blue and rose madder over a foundation wash of yellow ochre. Try some of these. As a beautiful example based on this general method turn to Hughson Hawley's painting, Plate 86, as well as to his other examples, pages 111 and 215. This artist has brought this type of sky to a marvelous degree of perfection. We also have a sky of somewhat similar type in Plate 85 by Paul F. Watkeys. This will be discussed a bit later.

MINGLINGS ON MINGLINGS We should perhaps make clear that when the desired effect is not obtained in a single mingling, it is sometimes best to allow it to dry, later superposing it with another. Often in the second mingling nothing is attempted but the modeling of the clouds. Occasionally the foundation mingling is scrubbed a bit before the other is added.

GLYCERINE AND ALCOHOL When washes tend to dry too rapidly, as in large skies, ten or fifteen drops of glycerine to each cupful of mixing water will serve as a preventative. Contrarily, if drying is annoyingly slow, it can be somewhat accelerated by the addition to the water of a small quantity of alcohol.

EXERCISE 60: ERASED CLOUDS At 2, Plate 89, we have clouds created by erasure. The background grade was run with a mixture of Antwerp blue and alizarin crimson, a bit of aureolin yellow being added towards the horizon. When dry, an ordinary red eraser was employed. No shield was used. Smoke, rays of light, and the like can be indicated by this same means. Experiment with it.

DIRECT HANDLING Somewhat more difficult to manage are clouds of a clean-cut nature such as are suggested by Sketch 3, Plate 89. It is usually best to sketch their shapes very delicately in pencil. Then a pale wash, perhaps of yellow, is applied over the entire sky, clouds and all, for clouds are seldom pure white. When dry, the main sky washes are run, the cloud areas being left plain. Eventually they are modeled through washing or mingling, the direction of light being kept in mind. Sometimes sky and clouds are carried to completion together; this takes practice.

In working from clouds in nature one finds they fall into definite classes. It would pay him to learn, from books on the subject, their names and characteristics. Clouds as a whole are not as round as the beginner thinks them to be: some can be bounded with lines which are practically straight. Even when of one class, they often show, at a single moment, astonishing divergence of form. No two areas seem alike. A common fault of the artist is failure to observe this point. See Sketch 4, Plate 89, where the several shapes, *A, B, C,* and *D* are too nearly the same. In seeking greater variety, one should strive to avoid shapes suggestive of the human face, animals' heads, etc.

There is a type of direct handling in which the cloud forms are not particularly definite. We see this illustrated in Plate 39 by Williams, Plate 40 by Sheets, Plate 41 by Mitchell, and Plate 67 by Yewell. Some such representations are really a combination of wash work and mingling. They are done very freely.

EXERCISE 61 Try all sorts of experiments in direct handling, turning preferably to nature.

EXERCISE 62: STIPPLE In Exercise 58 we spoke of using stipple in cloudless skies. Now we advise you to build up cloud effects in stipple, somewhat on the order of that at 5, Plate 89. Use both transparent and opaque colors. In this instance, transparent pigments were opaqued by mixture with Chinese white.

EXERCISE 63 Sketch 6 shows another use of opaque color for cloud indication. The sky was first applied as a pair of superposed

washes of transparent pigment, one of soft blue and the other of pale red-orange. When dry, the clouds were painted with Chinese white, tinted with Naples yellow. This mixture was gradually diluted as it advanced down the paper, permitting more and more of the undertone to show through. Try this scheme. The sketches by Watkeys, Plate 106, and Bradbury, Plate 57, offer other suggestions.

COMPOSITION The artist, realizing the great variety of effects the sky presents, and knowing that exactly the same ones are seldom visible twice, takes advantage of this condition, especially in original compositions, by using the type of sky which best serves his purpose. This is particularly true in the case of the architectural renderer, who, forced to represent realistically buildings which do not yet exist, feels free to utilize all such elements as skies according to his needs. If his building is shown as a dark mass, like the upper portions of that by Alexander E. Hoyle, Plate 145, page 286, or the tower in Edgar Williams' sketch, Plate 39, page 108, he customarily contrasts it with a light sky or clouds. Sketch 1, Plate 90, was designed to illustrate this point. Sketch 2 illustrates the opposite condition, as do many of the skyscraper renderings, Chapter VII, Part II. When a building grades in tone, its upper portions dark and its lower parts light, as at 3, the sky is often rendered in reverse gradation. By such methods the sky is made to emphasize the building through contrast. Sometimes this opposition is more subtle: see Sketch 4. Again, skies offer no great contrast with the rest of the subject but, in a measure, serve as an extension of it. Samuel Chamberlain, for example, in his delightful sketch, Plate 87, page 187, did a thing which the renderer often does, making his sky in color, texture and pattern a natural continuation of the all-over design formed by his subject matter beneath it.

Paul Watkeys, on the other hand, in his rendering, Plate 85, uses the thought of opposition, bringing his sky very dark behind his light building (by means of one large wash with a settling mixture) but leaving it light behind his dark trees.

The renderer must avoid over-conspicuous clouds. Like trees, they should reinforce his architecture without detracting from it. In Sketch 5, Plate 90, we exaggerate common faults of the beginner, for here the clouds are too prominent and poorly related to the architecture. Sketch 6 is self-explanatory; compare it with Sketch 2 (*A*), Plate 65A.

Clouds and cloud shadows are sometimes useful in adding interest to barren subjects, as exemplified by Sketch 7. For further applications of this thought see Chapter VII, Part II. Particularly do the renderings by Edward Trumbull, pages 308 and 309, make use of clouds, smoke, atmospheric effects, etc. See how in that of the New York Telephone Building he has pushed the main structure well beyond those in the foreground by means of an intervening atmospheric tone from which the building gradually emerges, growing brighter and brighter until it comes to a clean-cut termination against the vivid sky above. It is fitting to mention the great variety of hue in this sky.

In connection with this latter point, see also the rendering by Lusby Simpson, Plate 156, page 297. Though there was no attempt to make this sky as convincingly real as the previous one, it forms a pleasing decorative background to bring into emphasis the somewhat severe architecture. Observe that its hue is green, this color being nicely recalled in the roof, truck, and other foreground tones below, a distribution tending towards chromatic equilibrium. Considerable scrubbing was done in this instance to preserve the airy quality of the rough white paper.

The direction of cloud movement is a thing sometimes utilized by the artist. If the perspective lines of a subject converge too rapidly in one direction, for instance, he can arrange the cloud lines (or direction of movement) to take an opposite slant. In short, clouds can help or harm a drawing to a surprising extent according to the manner of employment.

SUNSETS, ETC. It is hard to write much of value about sunrises and sunsets: one's success will depend largely on his powers of observation and retention. It is very difficult, in any medium, to obtain even a passable representation of the brilliancy of these dazzling effects, especially when one works directly from the subject where astonishing changes take place momentarily. Water color is less amenable to this purpose than oil or pastel. The best water color method, perhaps (we are thinking particularly of sketching), is to make many small color notes, fresh and direct, selecting the most effective of these for final development. Even the final will probably possess more of the spirit of the subject if done

swiftly, thus suggesting by its very handling the transitory character of the effect.

Not infrequently the artist turns his back to the setting sun, and pictures a subject flooded with its vivid rays. Renderers do this with architecture, too, perhaps showing the upper portions of their structures thus lighted while the lower stories remain in rich but subdued shadow. Yewell's example, page 296, gives one interpretation of somewhat this effect, though here he has expressed an earlier, and hence less brilliant, hour. Often it is a still quieter mood of morning or evening which the renderer tries to catch: see the fine studies by James Perry Wilson, pages 161 and 213, and Chesley Bonestell, Plate 88. In the latter we find the trees topped with an afterglow of light from the setting sun. Note, too, the faint suggestion of the moon. Such attempts have a far better chance of success than do those which aim to express the full brilliancy of a flaming sunrise or sunset. The color of the sky itself in this rendering by Bonestell is interesting. Observe the line of clouds bounding the top.

NIGHT SCENES Both the artist and the renderer delight, occasionally, in attempting night scenes. The latter finds that such effects as those by Wenrich (page 298) and Bonestell (page 301) are popular. The searchlight illumination in Bonestell's example, as well as the streaks of radiation in the sky in the former, serve much the same purpose as do the clouds in some of the other drawings so far considered, bringing pattern quality into otherwise barren areas.

DECORATIVE CLOUD ARRANGEMENTS Before leaving the subject of clouds we point to the drawing by Cecil C. Briggs, page 316, which shows that in conventional drawings of this sort clouds are often handled in a rather decorative manner. Here they are sufficiently subordinated to keep them from detracting from the architecture: in fact, taken in conjunction with the sail below, and the dark foreground shadow, they frame the tower nicely. While this drawing is before us, it is helpful to compare it with Edgar Williams' free sketch of the same subject on page 108. In the one, all is conventional; in the other, little is. The cloud treatment in each is appropriate.

Our cloud and sky discussion continues into the next chapter, covering spatter and spray.

CHAPTER XXIV

ON STIPPLE, SPATTER, AND SPRAY

THE AIR BRUSH AND LIKE INSTRUMENTS EXPLAINED

Skies and other large areas are so frequently rendered in stipple, spray, and spatter that it seems appropriate at this time to supplement our scattered remarks in earlier chapters by a few definite instructions on methods.

STIPPLE As to stipple, we have already had so much to say that we can now dispose of it with a word. We have seen that it consists of many tiny brush marks of either transparent or opaque pigment placed in juxtaposition. Though particularly popular for skies, entire drawings are often rendered by this means. Birch Burdette Long's mellow subject, Plate 96, shows, despite considerable reduction, the feeling of vibration which stippling creates. The virtues of the method are perhaps even better demonstrated in H. Raymond Bishop's beautiful study of the Bok Tower, Plates 169 and 170, pages 318 and 319. Here the stipple was combined with a coarser, stipple-like broken tone which is shown at full size in Plate 170.

The beginner sometimes makes his first contact with stipple through trying to hide faults. A poor rendering in transparent color is often saved through this pointillistic work, done in opaque color, naturally a painstaking process.

Through stipple one can combine a number of colors in a given area, which the eye will merge when at sufficient distance, or a single hue can be used. Quite a common method is to distribute evenly two or three analogous hues of about the same value.

EXERCISE 64: STIPPLE Extend the stipple practice of Exercise 62 to all sorts of subjects.

SPRAY Spray, though far less easily controlled than stipple, and a bit less harmonious, texturally, if brought into contrast with brush work, can usually be applied more rapidly, particularly where areas are large. It varies greatly in character according to the pigments chosen and the method of application. We have the extremely fine spray of the air brush, which shows almost no individual dots, and heavy sprays, commonly blown with some crude form of atomizer. Both transparent and opaque pigments are frequently employed.

Undoubtedly there is some justification for the objection, on the part of certain artists, to the use of spray, the customary claim being that it is too mechanical in appearance. Yet when fine, it can undeniably suggest surprisingly well such impressions as the vibration of atmosphere. And by its use extremely brilliant and beautiful effects are obtainable. It is particularly liked by architectural renderers and other commercial artists, as it helps them to speed up their work. The renderer generally employs it, however, only for skies and foregrounds, as it is hard to confine to small areas.

THE AIR BRUSH The air brush is the mechanical sprayer mainly used by the professional. It works on the principle of the atomizer, the pigment being forced from a container through a spraying instrument by means of compressed air or gas. Such instruments vary greatly in size and character. For sky work, etc., a brush like that at *A*, Figure 62, is satisfactory, as it holds sufficient pigment to cover a fair sized sky and yet can be adjusted to produce a fine enough spray to be practical for much more limited areas. Some like a smaller brush more like that at *B*. The author's favorite brush is shown in Figure 63.

In addition to a brush or two, one needs an air compressor and storage tank, or a drum of gas. Commercial art studios frequently have an electric compressor providing sufficient pressure to operate a number of brushes at a time. There are also portable outfits which are pumped up by hand. In the cities it is common to substitute carbonic gas for compressed air. One then needs no compressor as the gas is available in drums similar to those used in soda fountains, a single drum often lasting for months: when empty it is replaced with a full one. The brush is connected to the tank by a small hose. The pressure can be easily controlled.

ATOMIZER As an air brush outfit is relatively expensive, students usually seek sub-

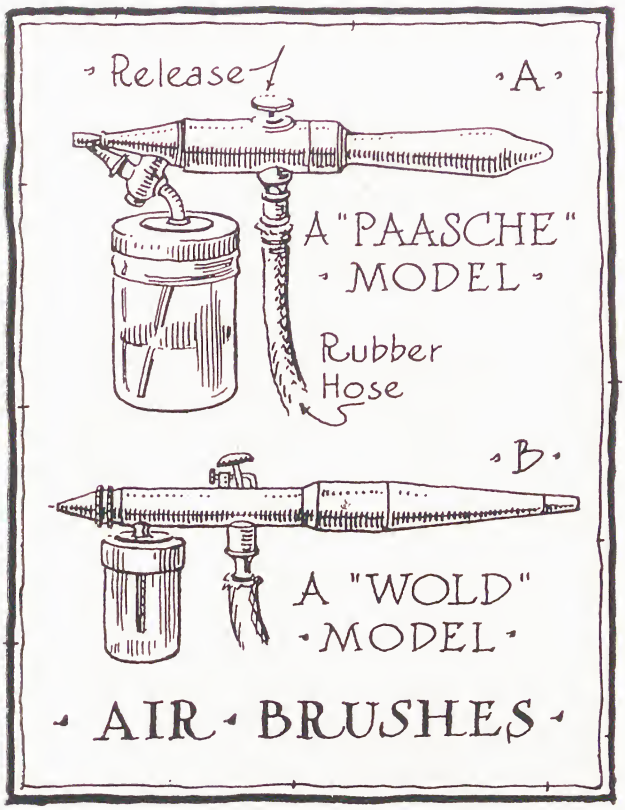


FIGURE 62

stitutes. The mouth atomizer used for fixatif is sometimes employed (see 3, Figure 65); with patience it produces fair results. Medical and perfume atomizers with bulb attachments, paint and insecticide sprayers, etc., often do very well. Though some of these throw a coarser spray than the air brush this is not always a disadvantage: coarse sprays of two or more colors, blown separately, can be extremely effective.

MASK OR STENCIL Whatever sprayer is selected, a way must be found to shield portions of a drawing from the spray. Usually one or more paper masks are made.

PROCEDURE In describing these it is perhaps as well to explain the entire spraying procedure. Let us take that of the architectural renderer working with an air brush as typical. His drawing is commonly laid out instrumentally in pencil with the greatest accuracy, even the shadows being cast. The paper must be absolutely clean before any spraying is undertaken. Not only is the eraser called into service for this cleaning, but the renderer follows it with a wash of water, perhaps slightly tinted (a bit of yellow is common), over the entire paper. This tends to restore the surface and "fixes" the pencil lines. If there are any areas where this water does not "take" they are suspected as danger spots, possibly a bit oily from the hands, and receive extra scrubbing. It is claimed that shiny papers can be advantageously rubbed, when dry, with whiting or powdered chalk, which insures adhesion of the spray. Next he lays his board flat, or nearly so, and covers it with a sheet of heavy tracing paper pulled tight and thumbtacked around the edges. The more impervious it is to moisture the better, the oily or waxy types being good. With a razor blade he cuts the paper along the profile of the building (and perhaps the trees) and around the margins bounding the sky, next stripping off the tracing paper from the sky, leaving it exposed. He then surrounds this area with strips of stencil board three or four inches wide as additional protection to the tracing paper covered drawing, bringing them as close to the opening as possible. Newspapers are now brought up to overlap these strips. In other words, every reasonable precaution is taken to protect all but the exposed sky from the spray. It is even necessary to weigh down these papers and strips to keep the spray from penetrating beneath them. Sheet lead, cut into various shapes, is useful here. If parts of the tracing paper mask are so small that they curl, stick them down with rubber cement: no cement

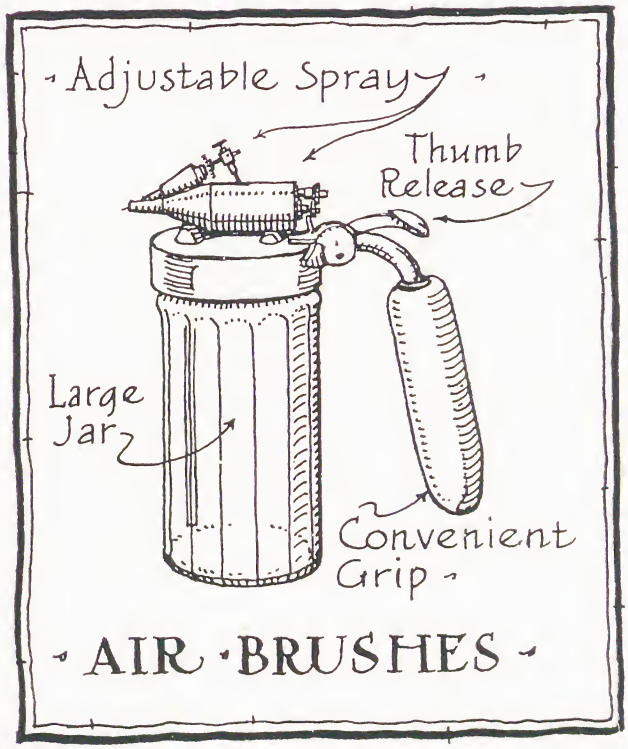


FIGURE 63

FIGURE 64

should be left where spray is to be employed.

FRISKET PAPER Art supply dealers offer a special paper for masking drawings, and are glad to explain its use.

RUBBER CEMENT If the profile of a building shows intricate details—finials, tracery, flagpoles, etc.—it is often easier to paint them with a couple coats of rubber cement than to protect them with paper masks. The cement can readily be rolled away with the finger when the spraying is completed.

While on this point we should perhaps mention that even in free water color sketching some artists use cement in much this same manner, perhaps painting birch trunks, flagpoles, masts, or things of that sort. The washes are then carried over the whole, cement and all: when dry, the cement is rolled away, revealing the white paper. This method is somewhat crudely illustrated by Figure 64 where the words were painted in cement, a gray wash superposed, and the cement rubbed off with the finger. Rubber cement can be thinned with naphtha or benzol to the proper consistency for brush application.

THE PIGMENT Though colors especially made for the air brush are available, ordinary water colors, mixed as for washes, do very well. Sometimes they are thickened with opaque pigment to increase their covering capacity: if too thick they may clog the brush.

THE SPRAYING This is advanced according to the printed directions accompanying the brush. With a bit of practice one learns the best air pressure, needle adjustment, distance, and angle. One generally works standing, as this enables him to swing the brush back and forth steadily, so as to build a uniform tone: if it is held still, even for a moment, a spot darker than the rest may be formed.

If one blows too coarse a spray, holds the brush too close to the paper, or sprays the same area too long, the minute drops of pigment on the paper may unite to produce an unpleasant mottled effect. It is advisable to interrupt the spraying frequently to permit drying.

The renderer can blow a dark tone from comparatively light pigment (though there is little point in doing so): it is all a matter of patience. And if his first color is not quite to his liking, he can blow another over it, this blending the two. Brilliant effects of great beauty can be obtained in this manner. Grades can be blown as easily as flat tones. In a sky such as we have been considering it is common practice to use very little pigment at the horizon, deepening the tone gradually towards the

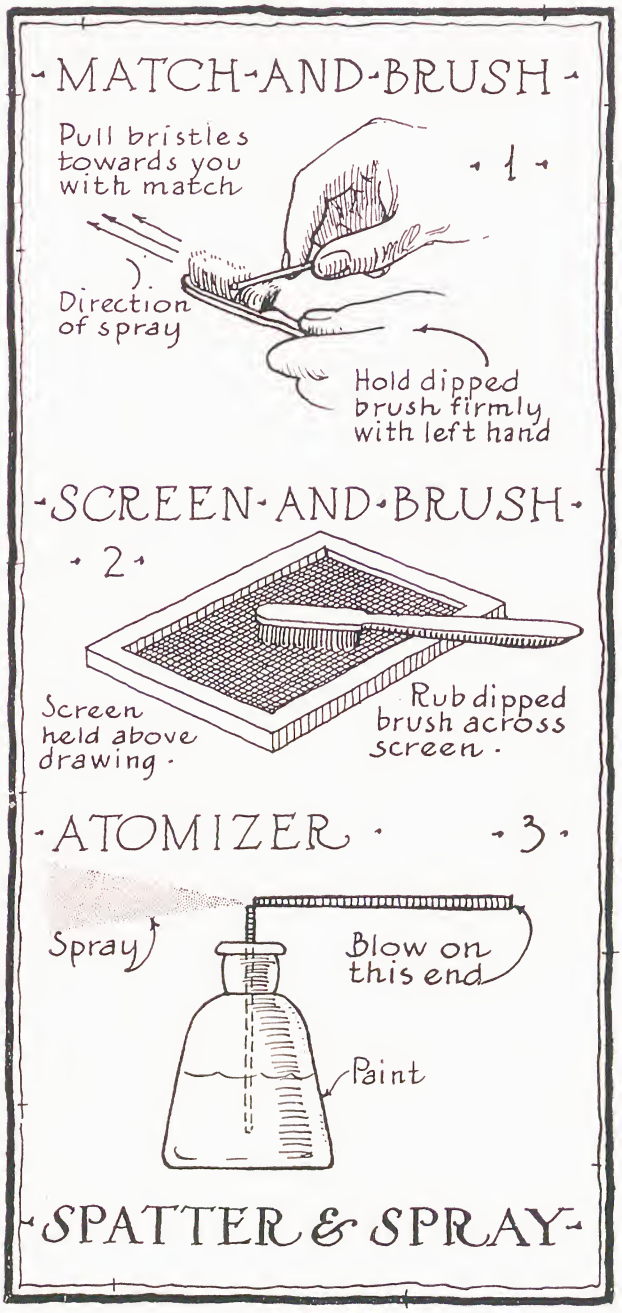


FIGURE 65

zenith. Antwerp blue makes a good sky for the typical problem, modified, perhaps, with French blue or cobalt above and a bit of aureolin yellow below.

In order to judge the hue of any area during the spraying process it is advisable to hold a piece of white paper against it now and then for comparison. Unless this is done, the final tone, when the protection is removed, is almost certain to be surprisingly dark.

When the renderer's sky is finished, the protective materials are removed, care being taken not to touch any of them to the sky as they may be wet underneath with spray. Air brush work is easily damaged and hard to repair.

CLOUDS A simple means of producing clouds in air brush skies is by using the eraser, picking out a few light ones here and there in a flat or graded sky as at 2, Plate 89. These can then be modeled, if desired, by means of the fine air brush.

In Plate 97, by Philip E. Bearse, we have an air brush sky with clouds produced by an extremely tricky method which has great possibilities. In this the renderer, as soon as his building is masked, usually sprays his entire sky with a light blue, very faint towards the horizon. The board is kept flat. When dry, fine sand is carefully sprinkled where the clouds are wanted: it takes a bit of practice to learn to do this advantageously, as effects must be judged in reverse. For the lightest clouds the sand must be piled so thick that no spray can penetrate: for vaporous ones a scattering will do. The author applies his sand by means of an ordinary envelope, tearing a small hole in one corner through which it is sifted. It is best not to change the location of the sand once it is on the paper, as by the finger or brush, as any attempts to do so are quite certain to be evident after the sky is blown. Therefore, if it is not well distributed the first time, the renderer brushes it off and tries again.

Next he sprays the sand lightly with water to dampen it and so hold it in position, after which he advances his coloring much as though the sand were not there. He must be careful not to blow it off, however, and the work must be interrupted several times to permit drying: if not, pigment may puddle under grains of sand, causing unsightly spots which only careful hand stippling can overcome.

With the sky dark enough, and dry, the sand is brushed off and preserved for another time. A small air brush is next used, as a rule, for modeling the clouds a bit, though sometimes careful highlighting with the eraser here and there through the original blue spray completes the work with absolute satisfaction. The cloud highlights in Plate 97 were done thus.

When the protective masks, etc., have been removed, and the rest of his rendering has been completed in the customary way, the artist commonly turns to his air brush again in order to bring some of the portions not in air brush into closer harmony, texturally, with the sky. In Bearse's rendering the lower corners were slightly sprayed. No mask was needed. Sometimes a cardboard reversed silhouette, cut to the shape of building or tree shadows, is laid over the lower portion of the drawing and the foreground blown with shadowy hues. The cut-out can be held above the paper a half inch or so, making a soft edge possible.

We should perhaps mention that the flagpole in the drawing by Bearse was ruled with Chinese white after the sky was done. The flag was then brushed in with opaque color.

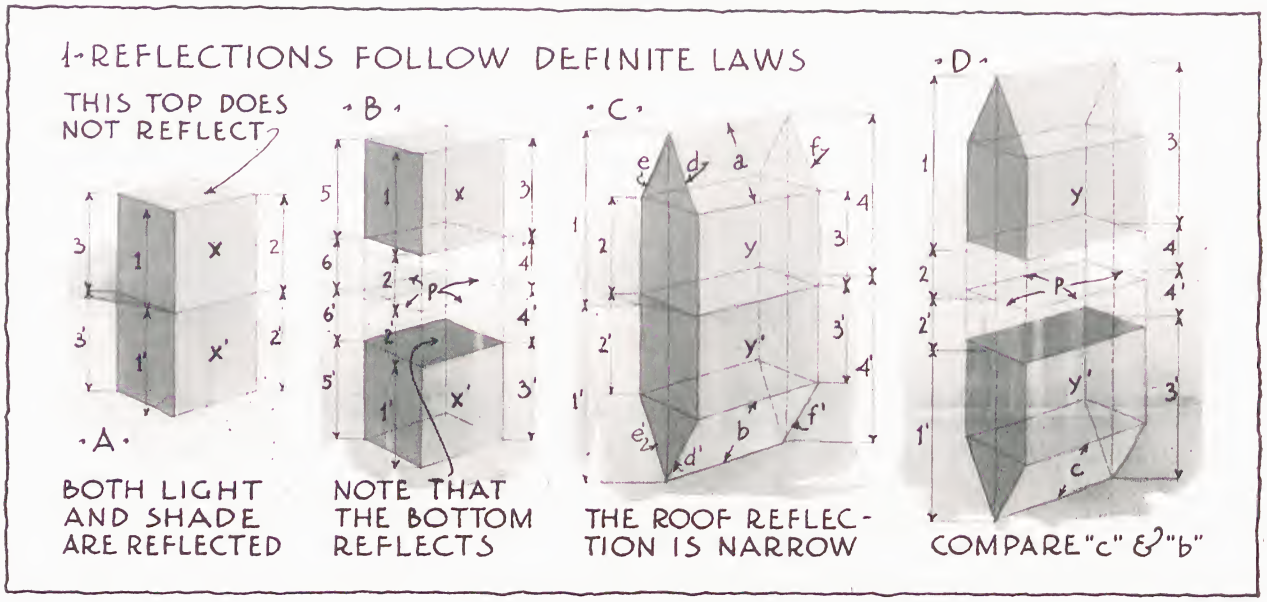
Rarely, entire renderings are done with the air brush, many masks then being required.

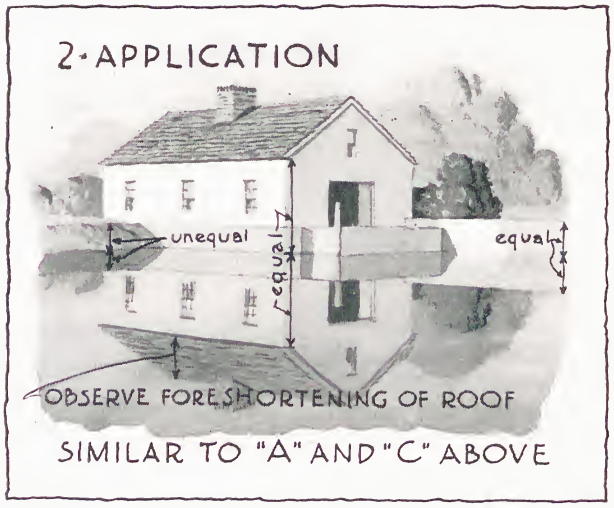
There are numerous other uses of spray which the artist will gradually discover. Sometimes an entire drawing, if too dark, is given an extremely fine spray of some light pigment, generally opaque. See the description, page 303, of William Gillette's drawing, Plate 164. Foggy effects can be obtained in the same manner. Coarser sprays, or spatter, are splendid for snow effects: see Edward Dixon McDonald's drawing, Plate 98. An ordinary fixatif blower will do for this sort of thing.

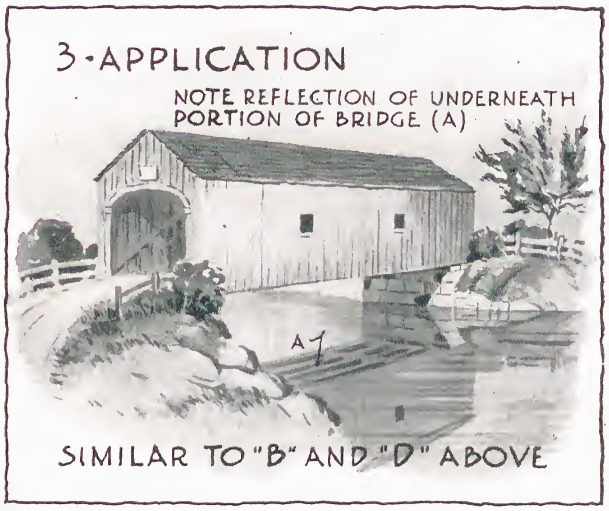
SPATTER If the renderer has no instrument at hand suitable for spraying, or prefers a somewhat coarser result, spatter may serve his purpose. As in spraying, he commonly protects at least a part of his paper. The board is usually kept flat or nearly so. An easy way of applying the spatter is illustrated at 1, Figure 65. The biggest objection to this method is that the brush must be dipped repeatedly. Again, over-large drops may be thrown on the paper. Better control can be obtained by means of a screen—see Sketch 2. We have already pointed to Sketch 3, which shows the mouth atomizer: much of the spraying done with this resembles spatter work.

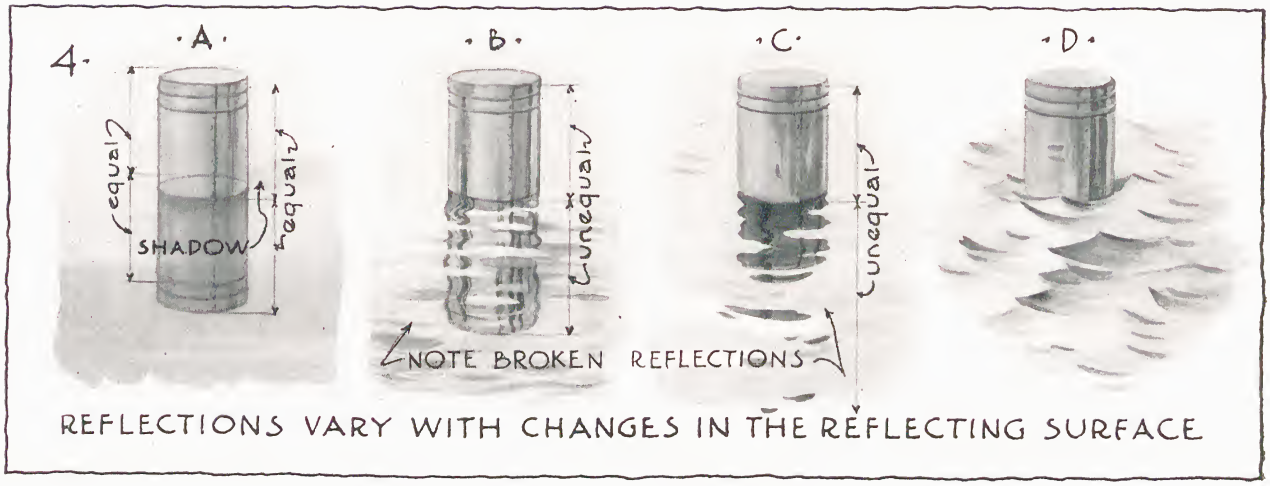
The architectural student often uses spray or spatter to overcome poor washes. Sometimes, as on skies, black ink is selected for this.

EXERCISE 65 Try some spatter and spray.









REFLECTION REPRESENTATION MUST NOT BE NEGLECTED

A few basic principles can be easily acquired

CHAPTER XXV

THE TREATMENT OF REFLECTIONS

HINTS ON THE INDICATION OF GLASS, WATER, ETC.

Before turning to our plates which show reflections in color, it seems advisable to investigate some of the principles involved.

First let us consider reflections in horizontal planes—such reflections as we see in wet streets, shiny floors, glass table tops, etc. Our immediate concern is with the correct construction of these. Not only are their shapes fully as important as their values or hues, but they are more subject to rule. We shall concentrate mainly on simple geometric solids: the principles involved apply to many objects.

At *A*, Sketch 1, Plate 91, is a cube as seen below the eye, supported by a shiny horizontal plane. As normally viewed such an object reflects its own image, inverted. In other words, if we drew a second cube below the first, properly constructed according to the laws of perspective, it would serve as the reflection of the first. Line 1′ would be equal in length to line 1, 2′ to 2, and 3′ to 3. By connecting the lower ends of lines 1′ and 2′ we could complete plane x′, the reflection of x.

At *B*, the cube has been raised by a distance equal to line 2. In this case line 1, the front corner, still reflects its own length at 1′, but this reflection appears as far below the horizontal reflecting plane as the line itself is above it, line 2′ equaling line 2. In other words, if we lifted the cube an inch above the plane its reflection would drop to an inch below it. Plane *P* shows the original position of the cube. In laying out this diagram this was the first thing drawn, perspectively equal lines then being measured off above and below. It is interesting to observe that the top of the solid does not reflect in either Sketch *A* or Sketch *B*, but in the latter the bottom does, and, since it is in shadow, its reflection is very dark.

At *C* we illustrate an extension of the truth expressed at *A*, for here we simulate a building by means of a triangular prism resting on a square prism in turn supported by a flat reflecting plane. As in the previous examples, every vertical line, including the gable lines, 1 and 4, reflects its own length, by actual measurement. As a result of the position of these objects below the eye, however, line *d* automatically (through perspective foreshortening) reflects at *d′* as a shorter line, line *f* following the same law; line *e*, contrarily, reflects at *e′* as a longer line. The entire plane *a* shows a comparatively narrow reflection *b*. As in the case of the first cube, the reflection of the building is drawn exactly as the building would appear if inverted, with its base occupying its original position.

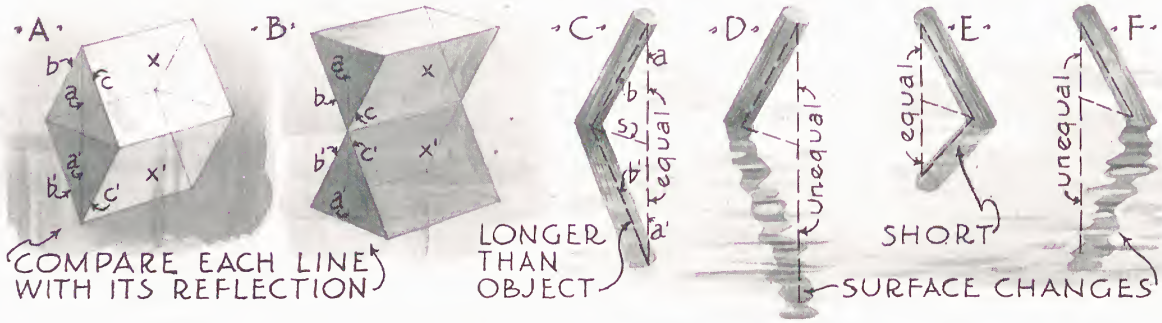
In Sketch *D* the building is raised as was the cube at *B*. Again, as the object was brought above the reflecting plane, its reflection dropped an equal distance below it. Plane *c* is even narrower than was *b* in the previous example, because further below the eye.

EXERCISE 66 You can learn much about such reflections through experimenting with actual objects placed on, or held above, a horizontal glass mirror. Better yet, use as a reflector a flat piece of plated metal, or other highly polished material, for the ordinary mirror sometimes shows double reflections which prove confusing, one caused by the surface of the glass and the other by the silvered coating on the back.

Sketches 2 and 3 illustrate pictorially the application of these principles. Here the water is calm. The values of the reflection have been shown slightly darker than the surfaces reflected, this representing normal appearances. The horizontal brush marks in the reflection at 3 help to suggest the slightly restless water. Observe here that the bridge is so viewed that its roof barely reflects, but the floor framing, invisible in the bridge itself, reflects at *A*.

REFLECTIVE SURFACES, NOT PLANE Sketch 4 shows us some truths about the reflection of vertical cylinders, at the same time demonstrating that the shape, size, and character of a reflection depend in no small measure on the reflecting surface. At *A* this surface is level and smooth, and, as in our previous

1. REFLECTIONS OF SLANTING LINES VARY WITH THE SLANT



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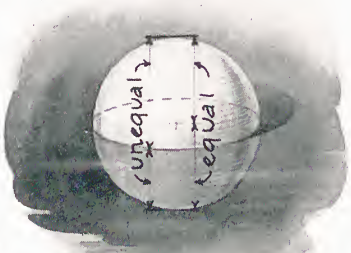


A HEMISPHERE AND ITS REFLECTION

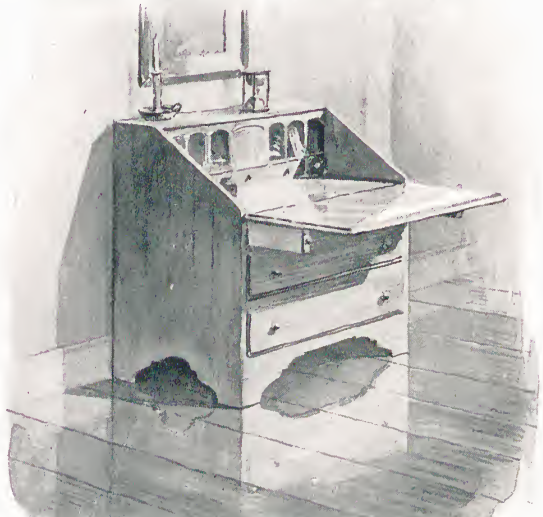
3

ROCKS CAN OFTEN BE TREATED AS SPHERES OR HEMISPHERES

4

AND HILLS ARE ALSO QUITE SIMILAR

5. INTERIORS AND FURNITURE SHOW MANY REFLECTIONS



IT IS USUALLY BEST TO SIMPLIFY REFLECTIONS AND SHADOWS

6. WET STREETS REFLECT VERY DEFINITE IMAGES

THESE REFLECTIONS ARE ALL ON HORIZONTAL PLANES

INNUMERABLE SUBJECTS SHOW REFLECTIONS

One must learn to observe them and analyse their cause

examples, the metal buoy exhibits a reflection practically like the object itself inverted. At *B* the water is enough in motion so its surface is somewhat like a slightly corrugated mirror, the reflection now becoming not only deformed and elongated, but broken here and there where areas are so turned that they fail to mirror the object. Furthermore, the reflection is constantly changing in effect because of the restlessness of the water. At *C* still rougher water has made these interruptions much more evident, and the total length of the reflection has further increased. One can judge at a glance that here the water is more disturbed than before. At *D* the definite reflection is lost, because of the actual waves which have formed, though these waves might still be somewhat affected by the object in value and hue.

EXERCISE 67 Experiment with cylindrical, conical, and other rounded objects, reflecting them in your horizontal mirror. Sketch some of them, with their reflections. Try to understand why each object reflects as it does. Also observe and sketch the reflections of objects, regardless of shape, as seen in actual water, both calm and rough.

Plate 92 illustrates a few additional points. Sketch 1 once more exemplifies the fact demonstrated on the previous plate—that reflections of slanted lines vary according to their slant, and the angle from which they are viewed. *A* and *B* need no new explanation: line *a'* in each is exactly equal line *a*. Note that *x'* is narrow in Sketch *A* and wide in *B*. The four following sketches picture another application of the same principle. In Sketch *C*, where the water is calm, line *a* represents the distance from the end of the sloping line *b* to the water. Line *a'* is equal to *a*. Despite this, reflection *b'*, like those of the roof lines in the former plate, looks longer than line *b*. In Sketch *D* the ruffled water further lengthens this reflection, at the same time distorting it. At *E* we are viewing the pile from the opposite direction. The reflection in the calm water at *E* seems short compared with the object: at *F* the disturbed water lengthens it.

It is not so easy to construct correct reflections for spheres, ovoids, etc., yet we can get in mind their general appearance with little trouble. At 2, for instance, we see that a hemisphere, in the position shown, plus its reflection, makes a complete sphere, though when below the eye like this a much greater area of the hemispherical surface is visible than is reflected. Plates 3 and 4 offer applications of this principle such as are common to many landscapes.

EXERCISE 68 Using your mirror or similar reflector, placed horizontally, experiment with solids like these. Model some little hills and rocks—in short any typical forms—with clay or wax, and study and perhaps sketch their reflections. Sketch real places outdoors where there are rounded hills, etc., reflected in both calm and ruffled water.

INTERIORS As we have reflections wherever there are reflective surfaces—and there are many such in furniture, polished floors, and the like—we must give these interior details some attention. Sketch 5 points to their importance. Perhaps the most significant thing about this is the floor treatment, in which a merging of reflection and surface texture is suggested. Reflections, as we have seen, are always modified by the character of the reflecting surface.

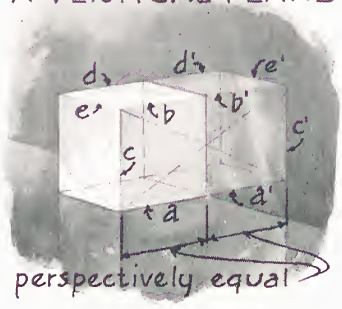
SUBORDINATION Many times interior reflections are so complicated that it proves best not to attract too much attention to them. Hence in the present example the desk reflection in the floor was soon allowed to die out. Often, shadows are likewise suppressed.

While on this matter, turn to Chapter IX, Part II, and study some of the floor reflections there. We especially call attention to those by Ernest Born, Plate 180, page 329, and Carroll Bill, Plate 182, page 335. Note in the latter how the forms of the reflections have been conventionalized. The renderer sometimes takes the liberty of varying the length of his vertical reflections according to the effect desired: for increased feeling of height in a room they are made long, and vice versa.

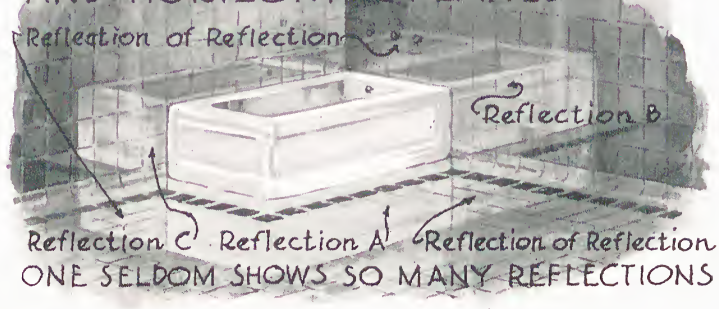
THE WET STREET On wet days we get a great variety of reflections outdoors which otherwise are non-existent, for almost any wet surface is more or less mirror-like. Wet streets and sidewalks reflect not only the light of the sky, but definite images of nearby things. See, for example, in Sketch 6 the clean-cut inverted images of the hydrant, street-lamp, barrel, store front, etc. The awning catches something the brilliancy of the sky, as does a portion of the window glass.

VERTICAL PLANES On Plate 93 we picture reflections on surfaces which are not all horizontal. The first four of these diagrams are our immediate consideration. At 1 we see

1·REFLECTION IN A VERTICAL PLANE



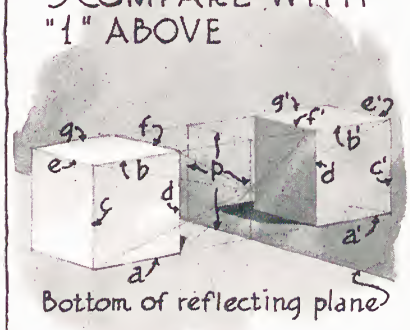
2·REFLECTIONS IN BOTH VERTICAL AND HORIZONTAL PLANES



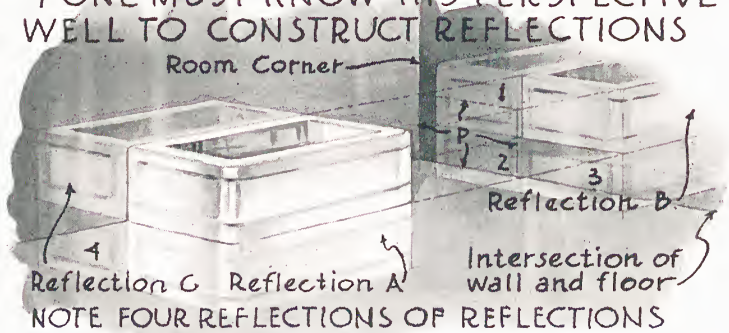
ONE SELDOM SHOWS SO MANY REFLECTIONS

THESE OBJECTS COME IN CONTACT WITH THE REFLECTING SURFACES

3·COMPARE WITH "1" ABOVE



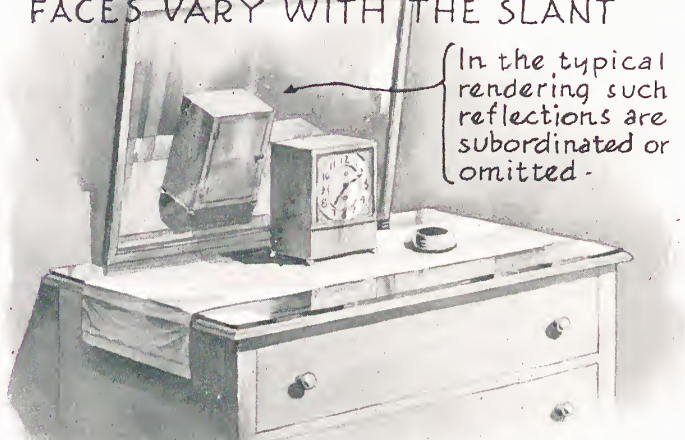
4·ONE MUST KNOW HIS PERSPECTIVE WELL TO CONSTRUCT REFLECTIONS



NOTE FOUR REFLECTIONS OF REFLECTIONS

HERE EACH OBJECT IS AWAY FROM ONE REFLECTING SURFACE

5·REFLECTIONS IN SLANTING SURFACES VARY WITH THE SLANT



BY EXPERIMENTING WITH MIRRORS ONE CAN LEARN MUCH ABOUT REFLECTIONS IN POLISHED PLANE SURFACES

6·POLISHED CURVED SURFACES REFLECT DISTORTED SHAPES

Brass watering pot

THE SMOOTHNESS OF SURFACE DETERMINES THE DISTINCTNESS

THESE DIAGRAMS REVEAL VITAL POINTS

They mean little, however, without the accompanying text

a cube placed at the angle of intersection of vertical and horizontal reflecting surfaces. Not only does this cube reflect in the horizontal plane, as it did at 1, *A*, Plate 91 (though we have suppressed this reflection here), but in the vertical plane as well. This latter reflection, seen in this instance in angular perspective as it is, would be perspectively equal, but not actually equal, to the cube. It would look exactly like a second cube beyond the first and in contact with it. A simple method of constructing a reflection of this type is demonstrated by the diagonals which, running from the extremities of line *c* through the center of the upright line of contact of the cube and vertical plane, cut lines *a* and *b*, produced, to establish the extremities of *c'*, the correct reflection of *c*.

EXERCISE 69 Place horizontal and vertical reflectors as at 1, with a cube or like object at their intersection, and study and sketch the reflections. You will discover what amounts to four cubes including the original, its reflections, and the reflections of the reflections.

THREE REFLECTORS At 2 we picture a practical, if not beautiful, demonstration of the reflections of a bathtub in a floor and two adjacent walls, all of glazed tile. The tub reflects invertedly at *A*, *B*, and *C*, and in addition we have reflections of reflections, as marked, the total effect being that of four tubs with three visible inverted reflections.

EXERCISE 70 Arrange three reflectors in this way, with a rectangular prism—a cardboard box is good—at the intersection. Study and sketch the effect from several angles.

Now we turn to Sketch 3, where the cube pictured at 1 above has been moved away from the wall. At *P* we show the original area of contact. The reflection is perspectively as far behind *P* as the cube is before it. See how diagonals have been drawn through the center of the near edge of *P* as an aid in the construction of the reflection. Note that the shadow cast behind the cube, barely visible in the drawing of the cube itself, shows plainly in the reflection, as does the shade on the back.

EXERCISE 71 Experiment with and sketch from objects placed at various distances from a vertical reflector, as here, and turned at different angles. Base similar experiments on the conditions exemplified in Sketch 4, where a tub much like that above has been moved from the corner; note that in addition to the normal reflections *A*, *B*, and *C* there are now four visible reflections of reflections, 1, 2, 3, and 4.

TIPPED PLANES When we come to reflections in tipped planes, such complications arise that we have space here only to call attention, by means of Sketch 5, to the basic truth that reflections in slanting surfaces vary according to the slant, as well as to the angle from which seen. If one wishes to work such problems, he must be familiar with the laws of instrumental perspective. For all practical purposes, one can manage well enough through experimentation with mirrors and the like. And remember that reflections are usually subordinated anyway, and often omitted.

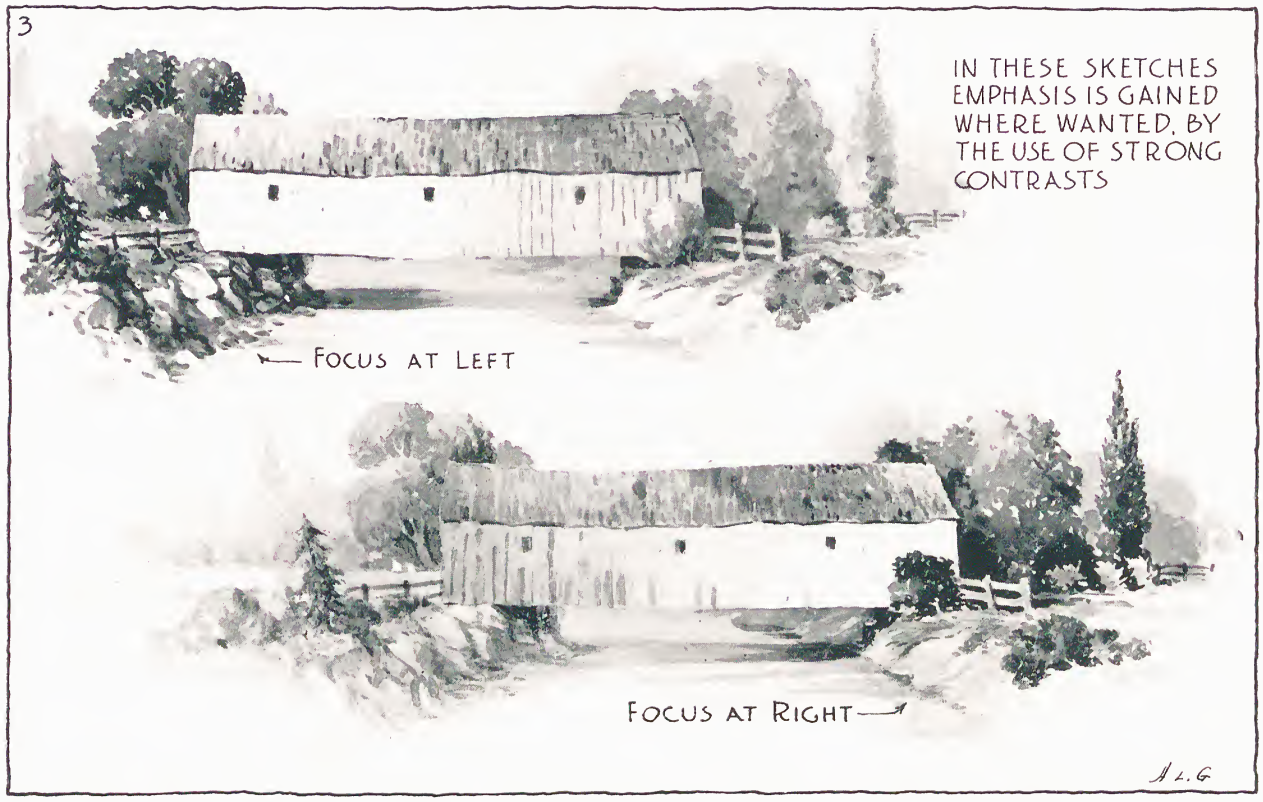
CURVED OR IRREGULAR REFLECTORS We have seen that in ruffled water reflections are distorted and broken. Similarly, we can recall the curved amusement park mirrors that do such absurd things to us. There are many smaller reflecting surfaces all about us which in their power to distort are similar to these—polished lighting fixtures, dishes, nickel trimmings to automobiles, etc. The smoother they are, the more distinct the reflections. The watering pot of polished brass at 6 looks shiny because of the sudden changes in its tones. It is reflecting a number of things. It is impossible to construct this type of reflection by rule; still life painting is the best means of gaining acquaintance with it.

COLOR Reflective surfaces reflect color just as they do light and shade. Clear reflectors reflect the natural colors of the things reflected. Your image in the mirror reveals your own hues; your brown suit reflects as brown. Colors reflected in colored reflectors are often modified thereby. If a yellow bowl is reflected in a blue tray the two colors may blend to produce a greenish reflection. On the contrary, where the light is strong we often find reflections on smooth shiny objects so bright that they have annihilated entirely the local color. In painting still life, for example, the artist discovers on objects high lights (reflections) which are diminutive images of windows or other sources of illumination, and so brilliant that in them no hint of the local color of the reflecting surface can be detected.

The color of a reflection may be altered in hue by the simultaneous reflection of some other color from a different source. Shiny objects, curved in form, frequently exhibit a merging of colors borrowed, by reflection, from other objects. (If objects are transparent or translucent, like glass bottles, their colors

ATTENTION FOCUSED AT UPPER ARCH

HERE THE FOCAL POINT IS LOWER



THE STUDENT MUST LEARN TO DRAW ATTENTION WHEREVER HE WISHES

EMPHASIS AND SUBORDINATION ARE SERVANTS THE ARTIST MUST MASTER

Value contrasts play their part in obtaining them

are further modified by such colors as may be seen through them.)

EXERCISE 72 If you have not already done so, make some still life studies in color with this matter of reflections uppermost in mind.

REFLECTIONS IN WATER We find similar complexities and modifications outdoors, where water is our most conspicuous reflecting surface. We have already seen that, when it is in motion, reflections are broken or distorted. Reflections in water of objects in it, or nearby, are usually modified, too, by simultaneous reflections of the sky. In fact, a main reason why water so often looks blue is that it is reflecting the sky. And we have all seen sunsets brilliantly inverted upon water; a mere film of it, as on a wet beach, is enough. Trees, buildings, and like neighboring things are other tempering factors; even when they fail to mirror their own images they influence the general effect. Furthermore, water often has color of its own, being dyed by mineral and vegetable pigments, etc. And it is more or less transparent, so the colors of things below sometimes show through.

All this we introduce merely to make clear that no rules can be given for the proper representation of water. One must turn to nature for his lessons. If it is smooth, or practically so, one is usually safe in handling it much as he would a horizontal mirror. This Birch Long has done in his exquisite sketch, Plate 99, though here the reflections are sufficiently irregular to leave no doubt as to the mobility of the surface. Note that those of the bridge and red building at the left practically duplicate, in inversion, the objects reflected. As we come into the foreground, the perspective increase in the scale of the surface irregularities of the water causes marked distortion in the reflections of the distant buildings, yet it will be noted that they are still vertically beneath the buildings themselves. The blue *pali* at the right again reflect their own hues, slightly darkened, and within curved boundaries such as nature shows us. As an interesting exception to this general rule of an object reflecting its own color, note that the gondola and barge reflections have been pictured so that they are much greener than the boats themselves.

We again have somewhat mirror-like reflections in the painting by James Perry Wilson, Plate 100. Though done in oil, a like impression could be obtained in water color by means of superposition of washes. The reflections, while presenting enough variety of form to suggest convincingly the liquidity of the reflecting surface, at the same time roughly duplicate, in size, placement, and color, the general masses of the objects reflected. This painting is quite remarkable, incidentally, in that it pictures moonlight so well: it shows us that in such a representation we should keep our forms indefinite and our edges soft, while values should be few and simple, and color right.

Though different in several respects from this treatment, the reflection handling by Magonigle, Plate 171, page 320, has some similarities. It offers blues which are comparable in hue, as well as a like use of the complementary reflections of the lights. This excellent rendering should be studied with care.

The rendering by Bishop, Plates 169 and 170, page 318, and that by Swales, Plate 173, page 322, also show reflections introduced as foreground treatment. Other examples with limited areas of reflection are those by Freeman and Trumbull, pages 300 and 308.

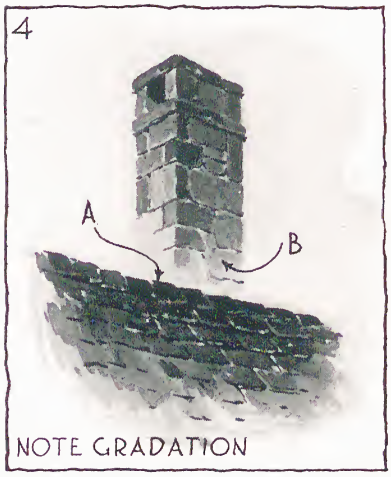
The ink and water color drawing by Lawrence Wright, Plate 101, has interesting reflections, too, only a few lines and tones being employed. Note the horizontal paths.

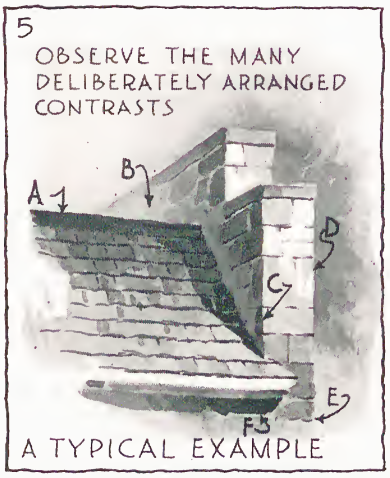
Another wet street, painted in color, is seen in Plate 102. Hughson Hawley was the artist. Here the reflections, though somewhat vague (and hence not too conspicuous), echo the general hues of the objects reflected.

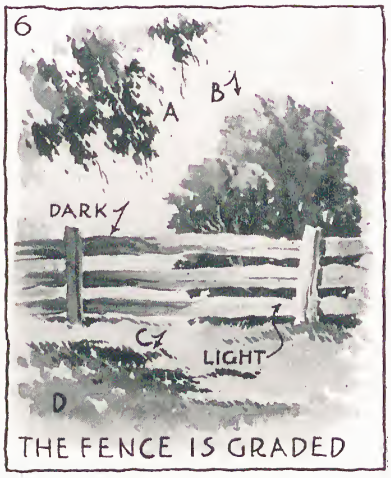
We have earlier studied Mr. Lawson's painting, Plate 38, page 107, which indicates clearly that it is by no means necessary always to paint water blue. Note the broken reflections, as of the archway of the bridge. When one neglects to provide such horizontal surface breaks as are utilized here, the eraser can sometimes be employed to advantage.

There are other representations of water in Bradbury's sketch, Plate 57, page 140, that by Witton, Plate 122, page 249, and elsewhere.

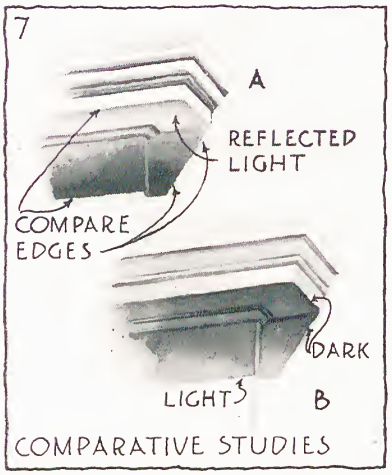
DISTANT OBJECTS USUALLY APPEAR LIGHTER IN VALUE AND FLATTER IN MODELLING (LESS CONTRASTY) THAN DO THOSE NEAR AT HAND

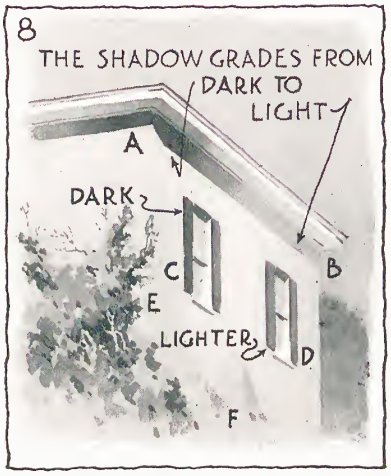


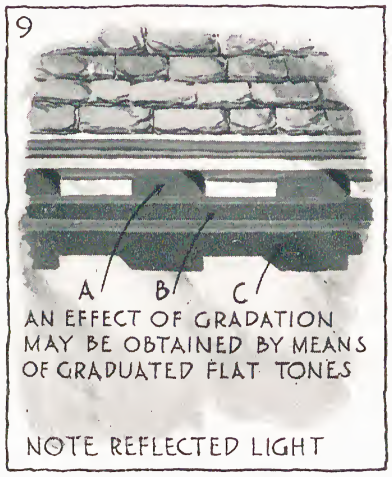




ONE SHOULD LEARN HOW TO GAIN AN EFFECT OF SEPARATION BETWEEN OBJECTS · GRADED TONES ARE PARTICULARLY USEFUL FOR THIS PURPOSE



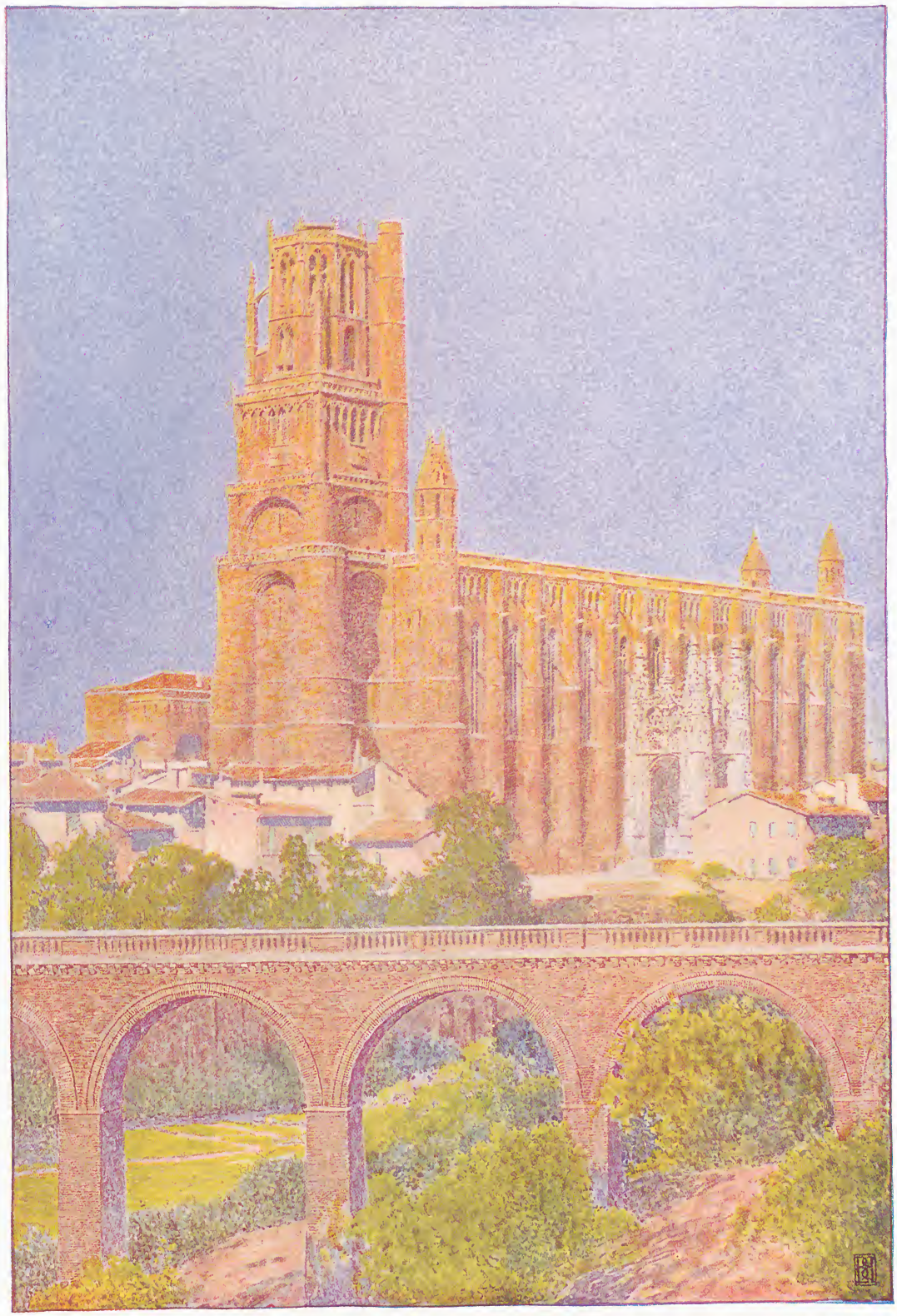




GRADED TONES HAVE SO MANY USES THAT THEY DESERVE THOROUGH STUDY · SHADOWS MAY BE GRADED TO ADVANTAGE IN MANY CASES

DISTANCE AND DETACHMENT OFFER INNUMERABLE PROBLEMS

Graded washes frequently aid in their solution



RENDERING BY BIRCH BURDETTE LONG OF CATHEDRAL OF ST. CECELIA, ALBI

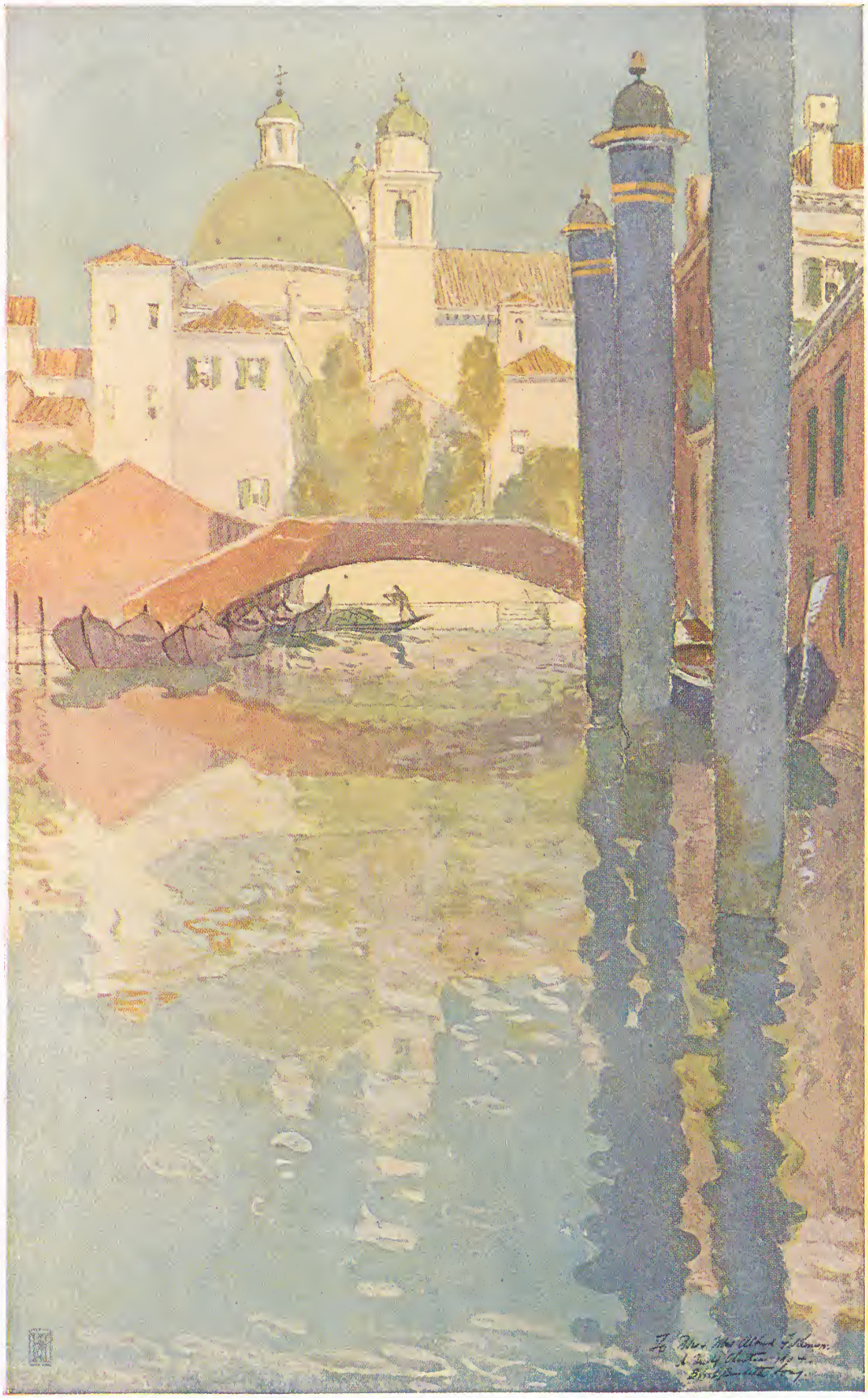
Stipple expresses well the atmospheric vibration common to skies. Original, 16½" x 24¼"

A BANK BY HOLMES AND WINSLOW, RENDERED IN WATER COLOR BY PHILIP E. BEARSE

Air brush skies are transparent and luminous, and often rich in hue. Original, 20″ x 23″

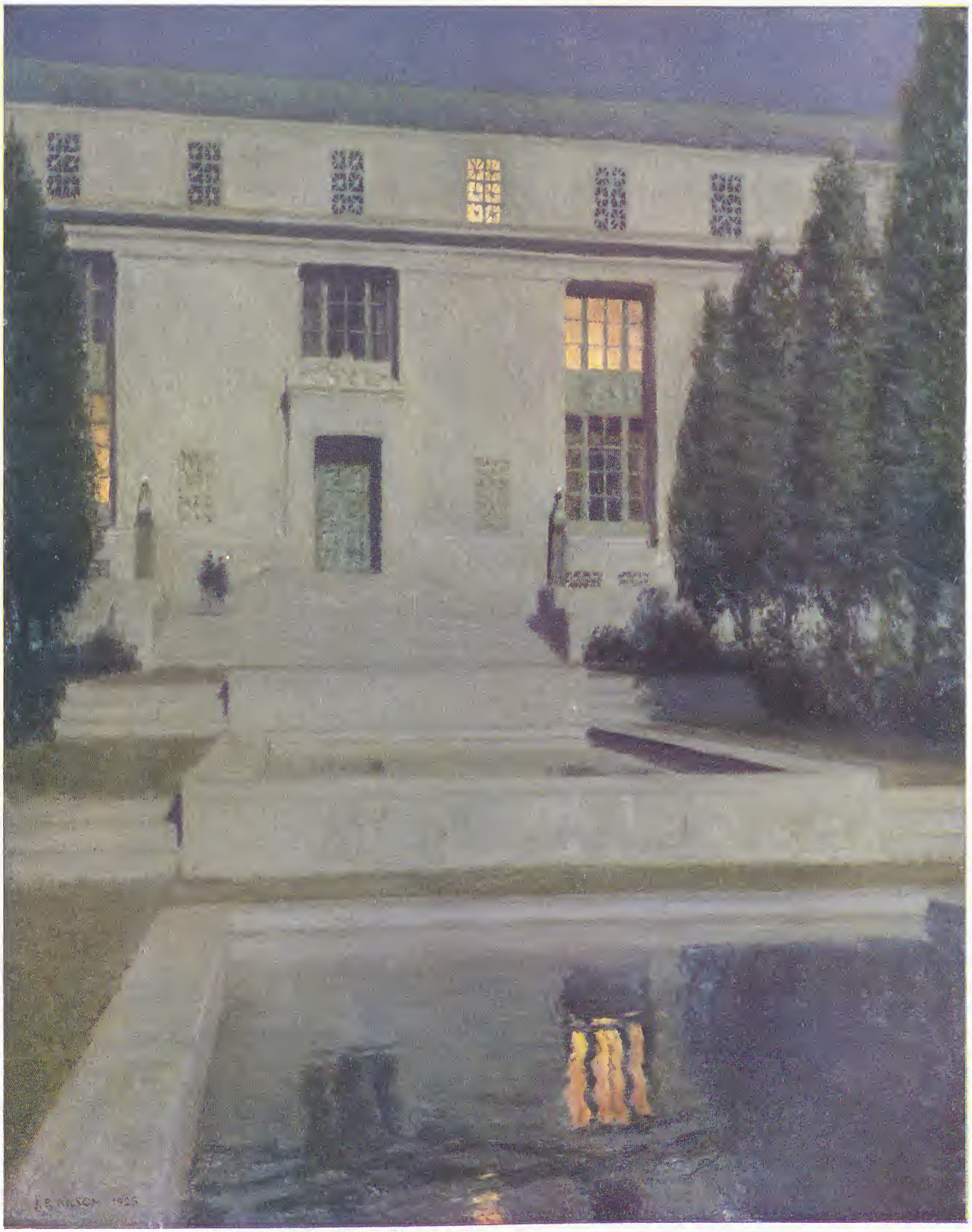
AN UNUSUAL WATER COLOR RENDERING BY EDWARD DIXON McDONALD. HOUSE BY MEADE AND HAMILTON, ARCHITECTS

A spray of white, when the rest was completed, gave the snow effect. Original, 28" x 14"



A VENETIAN SKETCH IN WATER COLOR BY BIRCH BURDETTE LONG

Here we have a splendid application of the principles of reflection. Original, 20½" x 12½", lent by Mr. and Mrs. Alfred Fellheimer

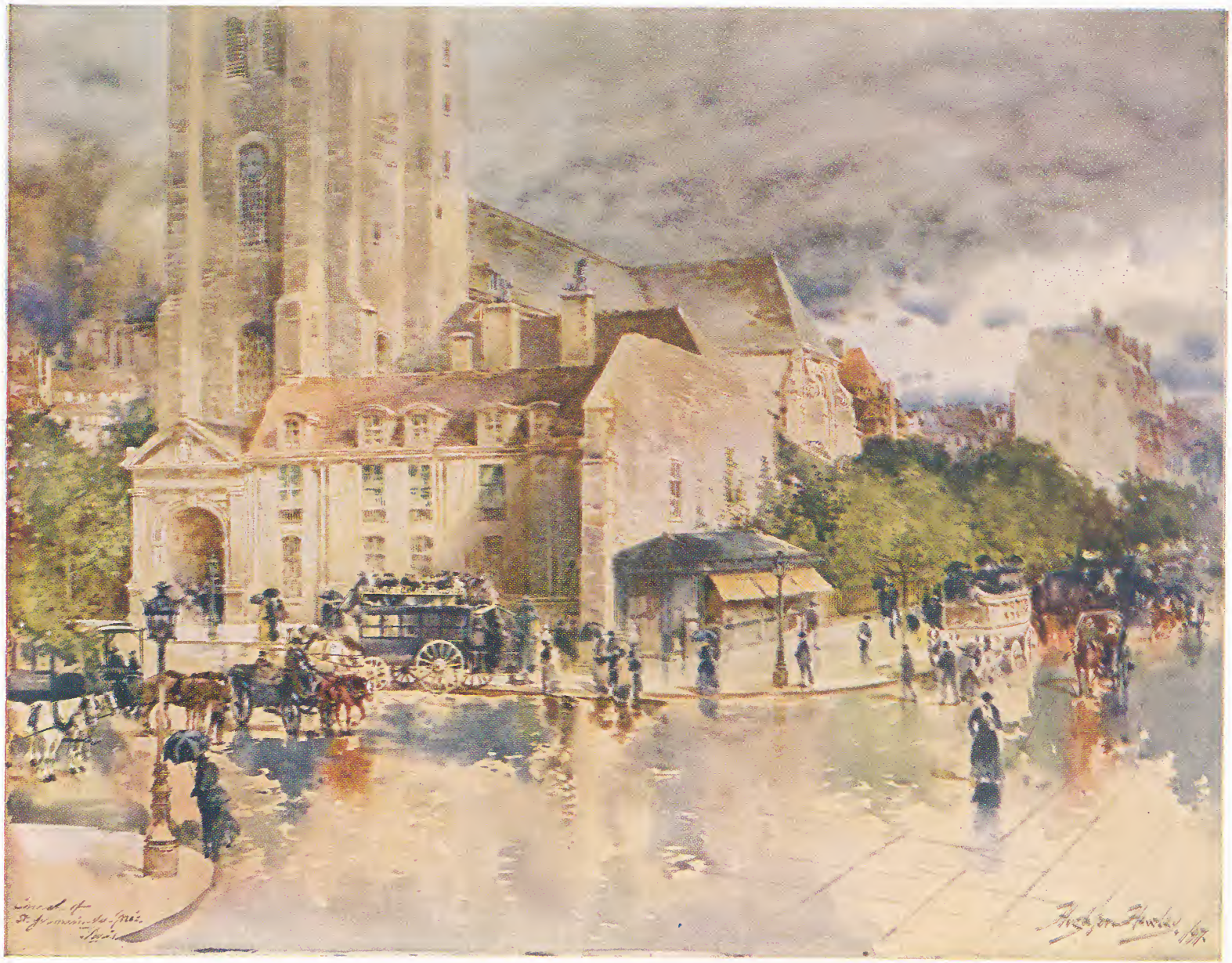


OIL PAINTING BY JAMES PERRY WILSON OF GOODHUE'S NATIONAL ACADEMY OF SCIENCES

The reflections here are properly placed and well managed. Original, 24" x 30"

STOCKHOLM, FROM A DRAWING IN INK AND WATER COLOR BY LAWRENCE WRIGHT

Here the reflections, though subordinated, have been executed with skill. Original, 11½" x 9"



CHURCH OF ST. GERMAIN DES PRÉS, PARIS, PAINTED IN WATER COLOR BY HUGHSON HAWLEY

The reflections on the street are consistently handled, each reflecting the color above. Original, 24" x 19"

HEGEREITER HAUS, ROTHENBURG, BAVARIA. SKETCH BY OTTO BIERHALS

The charcoal was "fixed" before the color was applied. Original, 12¾" x 18¾"

CHAPTER XXVI

EMPHASIS; DISTANCE; DETACHMENT

AND SUGGESTIONS ON THE USE OF GRADED TONES

We have repeatedly spoken of emphasis and subordination, the center of interest, distance, detachment, etc. Our present aim is to amplify and clarify a number of these matters.

EMPHASIS THROUGH VALUE CONTRASTS We mentioned some time ago the danger of developing two competing centers of interest in a sketch, destroying its unity. In the subjects on Plate 94 it would have been extremely easy to have done so. Trouble was avoided by emphasizing one center in each sketch, while subordinating the other.

In these examples this emphasis was obtained wholly through contrasts of value. Study Sketches 1 and 2 and you will see that each has exactly the same elements, yet at 1 the eye goes immediately to the upper portions while at 2 it turns to the lower, the attraction in each case being the strong opposition of lights and darks. In the sketches at 3 emphasis and subordination were again obtained through value control.

It is not only in this directing of the proper attention to a center of interest that value opposition is used; on the contrary, contrasts of light and dark are utilized wherever a bit of strength seems needed anywhere in a drawing.

EMPHASIS THROUGH COLOR CONTRASTS Another trick on which the artist relies when he desires to emphasize a given area is the use of color contrasts. They demand attention according to their size, strength, position, etc. Especially conspicuous are large areas of opposing (complementary) colors.

EMPHASIS THROUGH DETAIL If the artist details one portion of a painting more fully than another, this, too, draws the eye. Paradoxically, a plain area, surrounded by detailed areas, sometimes appears the more conspicuous because of its contrasting simplicity.

SIZE, SHAPE, TEXTURE Quite naturally, large things attract more attention than small, though small things of odd shape are sometimes more conspicuous than larger things of ordinary shape. A curve like the letter S normally proves more striking than a straight line of similar length, and a triangle, especially if inverted, has more compelling force than a square or rectangle. A star-shaped mass is particularly emphatic.

Texture often has force, also. Of two objects nearly alike, one plain and one textured, the latter will usually catch and hold the eye more readily than the former, though much depends on environment. Often the artist deliberately develops pattern in uninteresting areas, perhaps through tricks of technique, and so gains emphasis.

EMPHASIS THROUGH LOCATION A tiny spot in a plain area will attract attention to a degree wholly disproportionate with its size. A small airplane painted in a clear sky, for instance, will be seen almost immediately. In an area filled with heterogeneous pattern elements, on the contrary, a spot of equal size and strength might be lost.

MOTION Objects in motion attract more attention than objects at rest.

THE SURPRISE ELEMENT Anything unusual attracts attention, too, such as a man standing on his head or walking on stilts.

This is enough to show that the artist, especially if he does original compositions, must learn through experience how to make the spectator look at the things which seem to him essential.

DISTANCE It is a general rule that objects vary not only in size but in definiteness or distinctness in proportion to their distance from the eye, and can safely be thus represented.

There are exceptions to this rule so far as distinctness is concerned, for much depends on where the eye is focused. Though it is usually possible to see things more clearly if nearby than if at some distance, it is nevertheless true that if the eye is focused on something distant it may, for the moment, seem more distinct than something very close but out of focus. In expressing distance, therefore, a good way, many times, is to make the objects in focus

OPAQUE WATER COLOR SKETCH OF OCTAVIUS' ARCH, ROME, BY GERALD K. GEERLINGS

The paper plays a leading part in this vignetted treatment. Original, 9¾" x 12½"

WINTER LANDSCAPE AT NUTLEY, N. J., FROM A WATER COLOR BY WILLIAM T. ARMSTRONG

The foundation tone of brown paper is still visible here and there. Original, 20½" x 16½"

fairly distinct, and objects out of focus indistinct. The most common treatment, however, is to show things in the foreground quite strong in value and color and definite in detail, things in the middle distance softer (with somewhat blurred edges) and flatter, and things in the distance extremely inconspicuous. Sketch 1, Plate 95, demonstrates this; the eye is led back gradually from *A* to *B* to *C*, and a sense of space is created. At 2 we get a more dramatic composition, the eye taking a sudden leap from the dark foreground to the far softer middle distance. Though Sketch 3 offers somewhat the same contrast, the tendency is for this composition to lead the eye away by easier degrees. This is partly because of the value arrangement, though the converging lines of the buildings are a contributing factor.

In Francis Swales' elevation drawing, Plate 173, page 322, we have a composition stepping back by definite planes, values becoming less distinct as they are more distant. Another important point is exemplified here, for cooler and cooler colors are employed as distance increases. Floyd Yewell's perspective, Plate 154, page 295, shows a combination of two methods of obtaining a sense of depth. First, the converging lines of the architecture lead the eye into space, a thing which "linear" perspective often does. Secondly, we have depth created by what is known as "aerial" perspective—perspective of air or atmosphere. Often, as in a landscape or marine view, we have the aerial type but not the linear. Most architectural subjects, street scenes, etc., exhibit both.

To sum up, the artist gains distance in various ways, not only by making things smaller but through color and value contrasts or gradations, simplification, softer edges, linear construction, etc.

DETACHMENT When two objects are in almost the same plane, and it is desired to make one seem behind the other, the artist is sometimes required to "force" the feeling of separation. This is illustrated at 4, Plate 95. In order to set the chimney back of the ridge, it was graded lighter below (*B*) until it disappeared behind the sharp ridge line at *A*. This thought is illustrated again at *A* and *B*, Sketch 5, where the stone parapet (*B*) was graded to light behind ridge *A*.

GRADED TONES In innumerable effects of distance and detachment graded tones play a part, as here. See how grades have been deliberately utilized in many portions of Sketch 5. The roof, dark at ridge *A*, grades to light at the eaves, permitting the graded shadow at *F* to count, bringing the eaves forward through contrast. The parapet shadow on this roof takes the opposite grade, as does the parapet wall, which, though light at *B*, has become dark and sharp at *C*. Soft foliage has been graded against this wall at *D* and elsewhere, though below, at *E*, we discover the opposite gradation, the wall being darker than the foliage. This all proves how the artist can play around with his values, according to need, relying many times on gradation.

In Sketch 6 further uses of grades are shown. The overhanging branches grade to black at *A;* the shrubs, light at *B*, and so taking their place behind the branches at *A*, grade to dark behind the fence below, bringing it into sharp relief; the fence rails grade to dark at the left in order to throw them into contrast with the light background; the foreground tone grades from light at *D* to sharp and dark at *C*. Thus is a brilliant effect secured: the things which are near seem near.

Sketch 7 pictures some other typical grades such as nature constantly offers. At *A* the shadow tone grows sharp and strong at its lower edge but is light above, due to reflection from somewhere below. This gives a feeling of brilliant light and transparent shadow. At *B*, where there was little or no reflection, the grade is reversed. Sketch 8 demonstrates how another type of graded shadow can be utilized to give depth, or distance, the tone being deep at *A* and light at *B*. Corresponding lightening of the shutters from *C* to *D*, and of the vine from *E* to *F*, contribute to the effect.

In formal rendering, impressions of gradation are often obtained by means of a succession of stepped flat tones, as at *A*, *B*, and *C*, Sketch 9. The mouldings, between these areas, have been made higher in value, giving a feeling of light reflected from below. Note the reversed shadows of the mutules, caused by the reflection. Nature often shows us these shadows within shadows.

It is hoped that these suggestions will not only call attention once more to the frequency with which graded washes can be put to definite use by the artist, but that they will make him more observing of such phenomena as he sketches from nature, whether indoors or out. As a matter of fact grades are particularly common indoors, due to the diffusion of the light. See Chapter IX, Part II.

CHAPTER XXVII

UNUSUAL MATERIALS AND METHODS

OPAQUE PIGMENTS, INKS, OILS, PASTELS, ETC.

Though the bulk of our instruction to this point has had to do with the use of that type of water color paint commonly known as transparent, we have broadened our scope here and there in order to touch briefly on other colored media. It is our present intent to round out this first half of our volume by dealing a bit more fully with such media, with emphasis on opaque water color and water color used on colored papers or in conjunction with other media. We shall include a brief word on oil paints, pastel, etc., which, while not definitely related in one sense, nevertheless are easily mastered by the aquarellist.

OPAQUE WATER COLORS In Chapter I we pointed out that there are several types of opaque water color pigments. In use, however, they may be considered as one. They are capable of completely hiding the paper surface but can be diluted with water to any reasonable degree. Ordinary transparent colors are often made opaque through the addition of Chinese or other opaque white.

As a typical opaque palette we offer the following. It is that of H. Raymond Bishop, several of whose drawings adorn this volume. He says, of the way this palette is used:

"First the drawing is given a flat wash of transparent water color, generally Antwerp blue and rose madder. The body color is applied over that to obtain the highlights and shadows. Miller's Brush Colors No. 5, which consist of a set of twelve different hues, give as satisfactory and permanent results as any. The names of these are as follows:—blue, violet-blue, violet, red-violet, red, orange-red, orange, orange-yellow, yellow, yellow-green, green, and blue-green.

"Pleasing atmospheric effects can be obtained by using the color rather dry and dragging the brush lightly over the tooth of the paper. Since the opaque colors dry out much lighter, allowance has to be made for the change in value."

In opaque color work, all the other materials, including brushes, can be the same as for transparent color.

METHOD What Bishop has just said is enough to show that the common method of using opaque color is quite different from that employed for the transparent type. In many respects the former is more like oil paint, demanding a similar technique. Unless diluted it obscures, or nearly obscures, everything beneath it—paper, pencil lines, and other pigment. No longer is it possible to flow clear washes grading without blemish from hue to hue, or to build up effects by the superposition of wash on wash.

Yet there are compensations. One can, for instance, more readily repair faults; he can add lights (such as the flowers in Wenrich's drawing, Plate 84); he can accomplish much with stippling; he can utilize tinted paper to great advantage; he can produce soft, velvety tones not possible with any other medium.

Instead of starting with light tones and gradually adding darker ones, it is perhaps more customary to begin with the middle tones, adding both lights and darks. A bush, for example, could be rendered in middle green, the shade added with dark green, and the highlights with light green.

Since such colors are deceptive when wet, it is important to mix plenty of pigment if large areas are to be covered, as it is not always easy to match it again. A color cannot be correctly judged until a sample of it is dry.

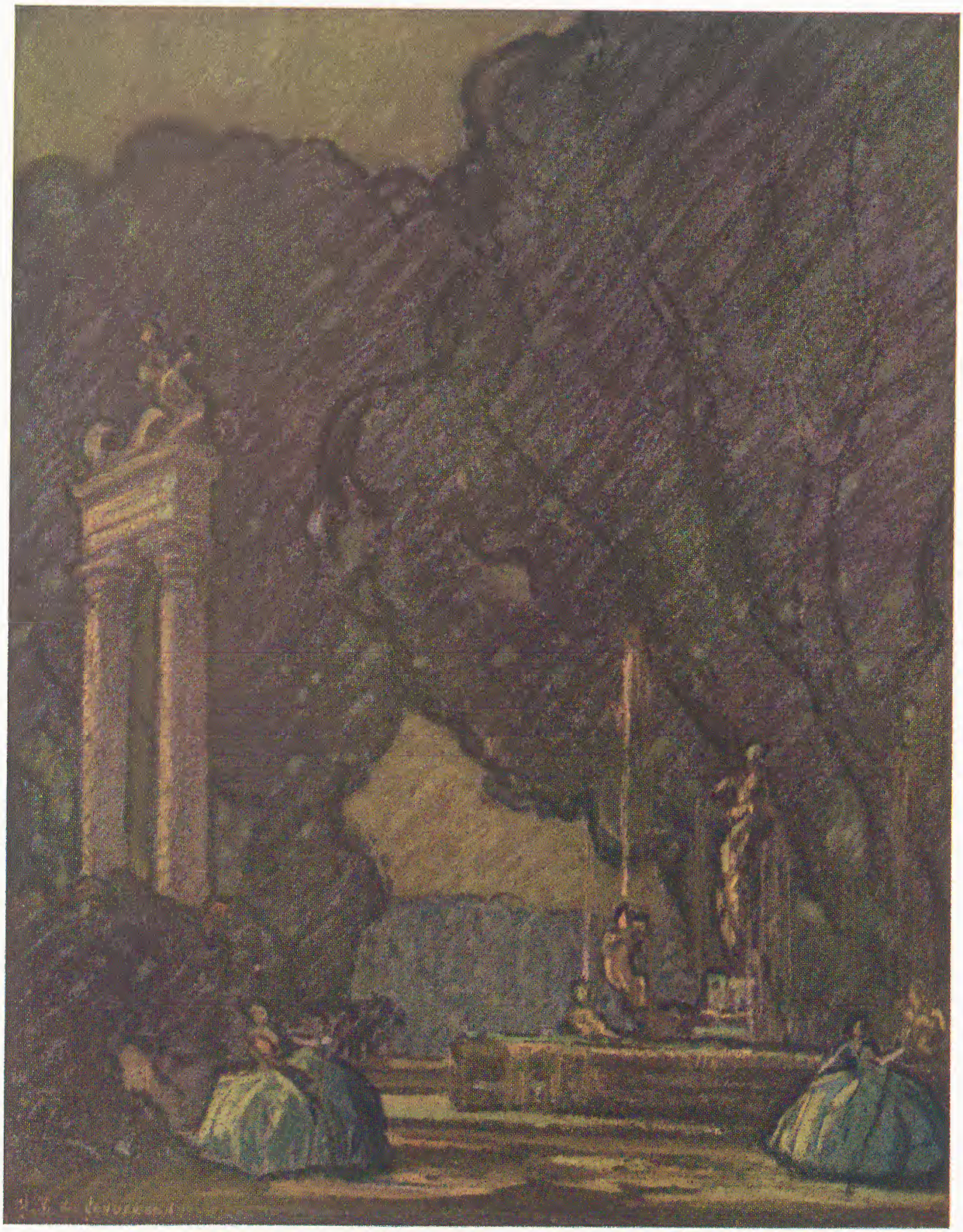
When opaque colors are greatly diluted they are handled more like transparent ones.

These are but general hints. It is only through experience that one can learn what opaque pigments can and cannot do.

ILLUSTRATIONS Triedler's painting, Plate 76, is a typical example of opaque work. Many of the rather decorative brush strokes are plainly visible, suggesting the method. Bishop's paintings of the Bok tower, Plates 169 and 170, pages 318 and 319, offer another fine treatment, as does that by the same artist,

A RESIDENCE BY TURNER AND BOWDEN, ARCHITECTS, RENDERED IN PENCIL AND WATER COLOR BY PAUL F. WATKEYS

This method is splendid for either sketching or rendering, especially when speed is essential. Original, 12¼" x 8½"



AUTUMN FÊTE. FROM A PASTEL DRAWING BY HARRY V. K. HENDERSON

This free but broad treatment was done on purple paper. Original, 11½" x 14¾"

Plate 19, page 76. Bishop depends to quite an extent on stipple, as we have already seen: this produces a richer, more vibrant effect than is possible in washes. McCrackin's drawing, Plate 23, page 82, was also in opaque, as were many others scattered throughout the volume. The colorful rendering from the office of Howard Greenley, page 339, with its crispness and sureness of handling, proves opaque to be well suited to interior work.

OPAQUE AND TRANSPARENT PIGMENTS COMBINED It is very common practice to combine opaque and transparent pigments somewhat as Bishop did in his delightful examples. To select a few other combinations at random, we have Born's sketch, page 138, that by Bradbury, page 140, and the renderings by Cruess, page 236, and Yewell, page 266. Sometimes one form of the water color predominates and sometimes the other.

WATER COLOR AND CHARCOAL Charcoal is frequently employed in conjunction with both transparent and opaque water color. When used with the former, the drawing is customarily blocked out in charcoal in a sketchy way, though sometimes quite a complete value study is made. This is then sprayed with regular charcoal fixatif, and, when dry, superposed with water color washes, the charcoal showing through to quite an extent. The second rectangle from the right at the top of Plate 29, page 92, shows one such possibility. The remaining areas in this row indicate that various pencils and crayons can also be used in something the same manner.

Plate 103, by Otto Bierhals, offers an interesting combination of color and charcoal. A charcoal sketch was first made on gray cardboard and fixed, after which opaque water color was applied, producing a vibrant and atmospheric impression. Obviously the colors were somewhat diluted or the charcoal would have been obliterated. The pigments used were yellow ochre, Venetian red, ultramarine blue, alizarin crimson, emeraude green, vermilion, white, and cadmium light.

OPAQUE COLOR ON COLORED PAPER Much opaque water color work is done on colored paper, the hue of the paper chosen depending on the subject. For a building with brown roofs, for example, a paper the color of the roofs might be selected, little or no pigment being used on the roof areas.

Such a combination is particularly practical for quick sketching. The example by Gerald K. Geerlings, Plate 104 (done on terra-cotta charcoal paper), suggests something of what is possible when time is at a premium. Here the sketch was vignetted, reducing the areas to be rendered. See how prominently the highlights count.

The architectural renderer will be interested to turn again to the rendering by Coffin, Plate 16, page 69, which was drawn on green tinted paper with brown ink, and then rendered with transparent water color and Chinese white. Note how important a part the paper plays. In Wenrich's rendering, Plate 84, on the contrary, the light brownish cardboard is quite thoroughly hidden. Another rendering of more than customary interest is that by Otho McCrackin, Plate 126, for here unusual materials have been successfully utilized. The drawing was on "Upson" board (a wall board) and the paints were sign-painters' colors, which permit fast work. An all-over transparent wash of light yellow was applied to the pencil layout, and, with some strengthening, was left for the color of the building. The balance of the rendering was done in opaque colors. When the whole was complete and dry it was gone over lightly with china-marking crayons, hitting only the high spots, after which it was fixed.

To show that these combined media lend themselves well to many handlings and types of subject, we turn next to William Armstrong's winter landscape, Plate 105. A brown English water color paper, plainly visible in places, gave the foundation tone on which both opaque and transparent water color were employed. Obviously opaque white, tinted as necessary, is in its element for subjects where snow is involved.

WATER COLOR COMBINED WITH PENCIL We saw in Plates 71, 72, and 73 how Otto Eggers and Schell Lewis use tints of water color over finished pencil work with remarkable success. Plate 106, by Paul Watkeys, reveals a somewhat similar combination. It was done on warm gray board, the drawing being first completed in pencil with delightful freedom. Transparent pigments were then employed for the building and foliage and Chinese white for the highlights and clouds.

The various illustrations of tinted pencil work in Chapter VI, Part II, should be studied at this time. In the student's original experiments with such media he should not overlook colored pencils; they combine harmoniously

with water color. We shall speak of them again in a moment.

WATER COLOR AND INK We have already seen, in Long's drawing, page 176, and that by Wright, page 214, that black ink can be effectively wedded with water color. As a rule the waterproof ink is selected; it can be applied with either pen or brush. Some drawings are fully completed in ink and merely tinted with water color; again the ink is used sparingly as a means of reinforcing the water color work. Wright's drawing, incidentally, with its interesting utilization of silhouette, was done very directly on gray tinted illustration board.

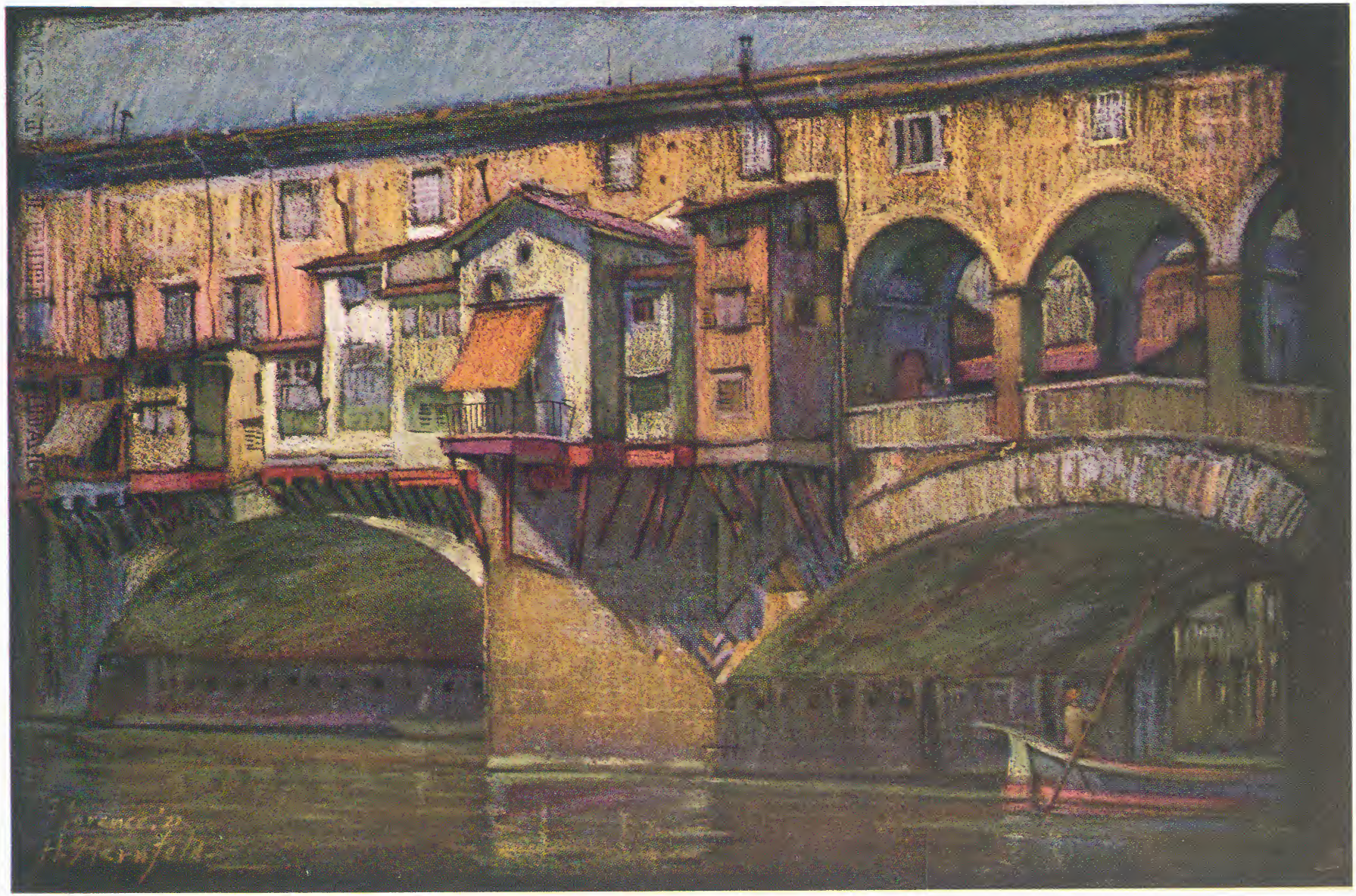
COLORED INK WORK As black ink sometimes seems a bit too harsh and persistent when employed in combination with the more delicate tones of water color, many artists prefer to dilute it or to substitute colored ink. Brown is particularly well liked. As an application see Swales' rendering, page 321. Here the subject was freely and suggestively outlined and accented by means of the ink. The old masters delighted in employing much the same method.

Another use of colored ink which is growing in favor is exemplified by the portion of a rendering by Robert Lockwood, page 272. Artists have long been troubled by foundation washes of water color softening under subsequent washes, resulting in unsightly defects. Waterproof inks in color, such as are made by Higgins, obviate this difficulty. They are available in many hues and can be mixed freely or diluted to suit. Once dry they are waterproof and durable. Mr. Lockwood's use of colored inks is unique. His drawing was laid out in pencil on pebbled surface mat board. The whole sheet was then sprayed evenly with a mixture of colored inks—brown, yellow, and a little vermilion—which did not obscure the pencil lines. This tone was left for all shades and shadows on the building with the idea of keeping the house "up on the hill" in value, yet away from the secondary portion of the composition—the hills—which were to be cool and complementary. The sunlit portions of the building were then painted in with opaque water colors, letting the pencil lines show to carry the drawing. The general formation of the hills and foreground was sketched tentatively as a skeleton, and the artist then commenced painting them. The foreground and background were kept going at the same time in order that all would hang together. As these water colors were applied, colored inks or dyes were often sprayed over them to produce a blending or working together of color. Values can be more easily changed in that way than when the brush alone is used, especially when a drawing is of large size. Note in the reproduction that the original brown ink shows through in places; this helps to integrate the drawing.

Many drawings are done entirely in colored ink. Sometimes it is applied with the pen, sometimes with the brush, and often with the two combined. Or it can be blown on or spattered. Dry brush effects are possible. In short, there is no end to the interesting opportunities. Paintings surprisingly like water colors can be made. The chief difference between ink and water color is that the former, being waterproof, dyes the paper. This may be of advantage, as in foundation washes, or of disadvantage, as when mistakes are made. Often when working with water color one feels that he would like the key of his entire drawing better if it were cooler or warmer or of some other hue. Frequently he can do nothing about this unless he resorts to spray (and here the results are problematical), for if he carries washes over the existing work the pigment previously in place may streak. When painting with colored inks, on the contrary, there is never a time when a superposing wash cannot be laid with perfect safety, even over the darkest accents.

Richmond and Littlejohns, in their *The Technique of Water-Colour Painting*, point to an interesting method of working in which foundation washes of waterproof inks are laid, after which water color, mixed with a little glycerine, is applied over the whole. The glycerine prevents rapid drying of the water color and makes possible the wiping out, with a stiff brush, of highlights or other areas, thus permitting the ink to show through.

MIXING MEDIUMS, ETC. This volume, incidentally, would be a splendid one for the student to read at this time. Not only does it offer numerous suggestions on the typical uses of both transparent and body color, with excellent illustrations, but it contains innumerable hints on all sorts of unusual media and methods. It explains some of the mediums which can be substituted for water, or used with water, for mixing pigments. It describes the employment of flour paste, for



THE PONTE VECCHIO, FLORENCE, DRAWN IN PASTEL BY HARRY STERNFELD

Dark paper lends itself graciously to crisp highlighting. Original, 18" x 12"

PASTEL DRAWING BY JEAN HEBRARD OF THE TEMPLE OF BAALBEC, SYRIA

Here the medium is used softly to interpret the spirit of tranquillity. Original, 15½" x 22"

instance. We recommend this book without reservation.

OIL PAINTS Our only excuse for trespassing into the field of oil painting—a subject to which nothing short of a complete volume could do justice—is that we wish to bring to the notice of our architectural reader the fact that an increasing number of renderings are being done in that medium. We shall be very brief, merely offering a few comparisons between water colors and oils, and a short description of some of our illustrations of oil work.

The only vital difference between water color and oil paints is that the latter are mixed in an oily vehicle. It is this which makes it necessary to substitute canvas, board, metal, or something of the sort for paper. It is this which causes oil paints to dry slowly, too, making them ill suited for work which must be completed in a hurry. It is the viscosity of oil paints, largely due to this vehicle, which makes them hard to manage where fine detail is concerned. Yet oils have very real advantages, not the least of which is their comparative opacity (except in thin glazes) which allows the artist to work over a painting again and again until the desired effect is obtained. This one factor results in their preference by many beginners who choose them knowing they can correct their mistakes. They can be blended easily, too, and permit soft edges. Oils, in the long run, are considered by many artists to be easier than water colors for painstaking studies (unless too much fine detail is involved) and inferior to them (more annoying at least) for quick sketches or paintings where the quick drying element counts. Comparing oil paints with opaque water colors we find, as we have said, that there are many similarities, particularly as to general method of application. It is, however, far easier to blend the former and easier to work in detail with the latter. The latter are more deceptive while wet, too, and, on the whole, less permanent.

Turning to our illustrations, we have already studied Plate 88, an example in which the artist, Bonestell, combined water color and oil. For his method see page 184. This rendering shows, among other things, that oil paint, properly diluted with turpentine, can be used for such wash-like effects as in this sky.

Plate 100, by James Perry Wilson, again demonstrates that, if desired, oil can produce results having considerable water color character. This painting has a softness and richness, however, which aquarelles often lack, as well as a luminous quality more easily developed in oil.

Let us now turn to a second rendering in oil by Bonestell, Plates 159 and 160. This was first laid out with a hard pencil on a fine-grained canvas and fixed with glue size. Thin oil glazes were then used to render the building: the highlights, sky, and foreground were painted in heavily over the glazes. The glue size prevented the drawing from disappearing when the oil glazes were being wiped off, so as much detail was preserved as the artist wished. The large scale reproduction, Plate 160, shows the handling very plainly.

In Plate 161, we again have a treatment in oil of a large building. The artist was Chester B. Price. The perspective layout was done on shade cloth. Preliminary studies for composition were made in charcoal, both at small and final scale. A color study in oil was then made, about a foot high. The final was started with thin oil and finished with full color.

Edward Trumbull also used oil in his rendering, Plate 162. Before making this, he submitted four pastel sketches to show the architects his proposed color scheme. The final painting was then done on canvas. It was for advertising purposes. A similar oil painting, Plate 163, is from the same hand.

For further description of all these renderings of large buildings, see Chapter VII, Part II.

PASTELS Again we venture a bit beyond our intended scope in turning briefly to the field of pastel drawing. Once more our excuse is that with increasing frequency we find this medium taking the place of water color in the field of architectural rendering: hence the renderer should know something of it. And we are by no means deserting the water colorist, for he often turns to pastels, either for preliminary studies or to use for finals in conjunction with water colors. As our hints must be brief we refer the reader interested in learning more of this medium to Richmond and Littlejohns' *The Art of Painting in Pastel.*

Pastel is a greaseless chalky crayon, available in sticks of various sizes and shapes and many colors. It is customarily applied to the paper in a linear manner, forming definite strokes or dabs of color. Sometimes, however, it is rubbed smooth, with finger or stump. Or smooth undertones are thus produced over

which the linear type of handling is employed. The paper selected is commonly rough, though smoother surfaces will do if they have sufficient tooth. Regular pastel papers are available, generally in colors. Charcoal papers are good. Sandpaper is popular. Pastel is often so applied as to allow the paper, especially if colored, to count quite strongly.

Though pastels are capable of work of unusual charm they have two distinct drawbacks or limitations. First, they smudge or rub off the paper all too easily. It is possible to fix them, to be sure (special fixatif is available), but as a rule they lose a great deal in the process. It is best to spray them several times, as the work proceeds, and, when finished, to get them under glass at once. Secondly, the soft crumbly nature of pastels makes difficult the accurate delineation of fine detail. They are, therefore, at their best for work which is large or rather impressionistic. A strong point is their delicacy of tone: no medium lends itself better to the interpretation of the subtle hues of flesh. Yet, surprisingly, they are ideal for brilliant sunset effects.

Now for our reproductions. We have already seen Harry V. K. Henderson's delightful composition, Plate 14, and now offer, as Plate 107, another example of his work. This was drawn on a purple sheet of French "Ingres" paper. It is certainly a most pleasing piece of coloring, well composed and strong in its decorative feeling. In handling it is vigorous, yet restrained; its breadth of effect might well be emulated. Simple as this sketch is, it expresses a great deal, as does its companion piece, Plate 14, with its cooler key. Both of these could be copied to advantage by the student.

Pastel was also the medium for Francis Keally's rendering, Plate 17, as brilliant in hue as Henderson's examples are sombre. A drawing was first made in soft pencil on tracing paper. This was rubbed onto fine sandpaper and the pastel applied with short strokes. The leading outlines were gone over, where necessary, with black or blue pastel. In a second study by the same artist, Plate 144, the tones were built up by means of innumerable dabs of crayon. This is an easy and highly successful method of obtaining broken color with its characteristic scintillation and vitality.

Another unusually fine example is that by Thomas Ewing King, Plate 78. The method is quite evident from the reproduction. Viladon drawing paper of a warm brown color was selected; the pastel was employed openly enough to permit the paper to show through in many places. Before the work in pastel was done, the subject was outlined in charcoal. We shall speak of this drawing later as an architectural rendering.

Miss Hunter's rendering, Plate 82, again possesses rare beauty. The paper was of a light cream tint, the pastel being left as it came from the crayon, with no rubbing. Note the vigorous handling of the foreground as contrasted with the more restrained tones beyond. Pastel is an ideal medium for the rendering of flowers, whether in masses, as here, or as single specimens.

Yewell's rendering, Plate 83, also in pastel, is described on page 185.

To illustrate further the possibilities of this medium we now turn to Plate 108, by Harry Sternfeld. This was done on black paper, its roughness being efficiently utilized in representing the texture of the architecture. Pastel is always effective on dark paper, especially where there are crisp lights and such other staccato touches as we have here. It makes possible, too, the easy development of a strong center of interest, through contrasts of hue and value.

See how different Plate 109, by Jean Hebrard, is, with its softer, more restful treatment. Here the artist has relied largely on tones of orange and blue, with hints of violet and other hues. The richness of tone and chromatic unity are to some extent due to the warm brown paper used, which modifies the pastel in many places.

To the renderer, William Gehron's sketch for a proposed building, Plate 110, should be full of interest. This was laid out very rapidly by eye in charcoal on dark brown paper such as is used for booklet covers. The charcoal was fixed before the pastel was applied. This method offers a rapid and effective means of producing a colored rendering and is especially useful in the early stages of design. We call particular attention to the freely and simply suggested figures; they give life and scale to, but do not detract from, the architecture. The architectural reader will be interested to compare this preliminary design in color with the photograph of the finished building which we reproduce on page 232.

He could learn valuable lessons, too, from the pastel sketch by Frederick R. Witton, page 249. This was constructed free-hand on a

STUDY IN PASTEL BY WILLIAM GEHRON FOR ENTRANCE, UNION TEMPLE HOUSE, BROOKLYN, ARNOLD W. BRUNNER ASSOCIATES, ARCHITECTS

The layout was made in charcoal and "fixed." Then the pastel was added. Original, 22¼" x 21"

COLORED CRAYON

HOUSE BY ATLEE B. AND ROBERT M. AYRES, ARCHITECTS, RENDERED IN CRAYON BY ATLEE B. AYRES

Such a treatment is especially practical where speed is essential. Original, 17½" x 11"

UNION TEMPLE HOUSE, BROOKLYN, N. Y.
Arnold W. Brunner Associates, Architects

sheet of light brown detail paper. It was quite large. Soft pastels were applied without rubbing so the effect was enhanced by the vibration of light typical of this medium when employed in this way. The drawing was made to show in perspective a suggested group of educational buildings.

COLORED PENCILS Closely related to pastel work is work in other colored crayons, and in pencils of waxy or oily type. No special instructions seem necessary, the main difference between such materials and pastels being that they rub far less easily, if at all. This is of advantage when it comes to the durability of the work, which requires no fixing, but is of disadvantage when smooth or blended effects are wanted. The points crumble very little, which makes them good for accurate line work or detail. Most of these materials can be successfully combined with water color, though some tend to repel it. Many oil or wax crayons can be used in conjunction with a solvent, such as carbon-tetrachlorid, benzol, or turpentine, to produce wash-like results.

Plate 111, by Atlee B. Ayres, gives us an excellent illustration of the use of colored crayons in pencil form. It was drawn on Ingres paper. Carbon pencil was employed for the layout, which was then worked over with a sponge rubber to lighten it, after which the color was applied and fixed. Such paper comes in a number of tints and a color can be selected to suit the subject.

WATER COLOR PENCILS The market is flooded with many so-called "water color pencils," which, for the most part, are nothing in the world but the old-fashioned indelible type. Though good work can be done with them, they are very tricky, varying as to solubility and some of them changing in appearance surprisingly under the action of water.

SEVERAL MEDIA IN COMBINATION What we have shown in this chapter is enough to make clear that the artist can discover almost no end of opportunities in the combination of different materials and media. Though we have offered no numbered exercises to acquaint one with such combinations, the student should by all means experiment at every opportunity. Too many artists grow lazy: they master one medium or method and then use it for the rest of their days. How stupid when there are so many fascinating and useful things to try!

PART II

ARCHITECTURAL RENDERING IN COLOR

CHAPTER I

REPRESENTING PARTS OF BUILDINGS

RENDERING WINDOWS, CHIMNEYS, AND LIKE DETAILS

The student who has studied Part I, carrying out the suggested exercises, should (assuming, of course, that he has a reasonable knowledge of architecture) be able to progress rapidly in architectural rendering. In this chapter we briefly discuss the handling, in transparent water color pigments, of such materials as stone, brick, stucco, etc., along with such portions of buildings as chimneys, roofs, and windows. Subjects of this nature afford a splendid starting point: it would be an excellent plan to experiment with them before attempting renderings of complete structures.

STONEWORK Stonework varies to such an extent in kind, finish, manner of laying, etc., that we shall not attempt to cover the field thoroughly, but do picture on Plates 112, 113, and 114 a number of suggestions for its representation. *A* and *B*, Sketch 1, Plate 114, are self-explanatory. At *C* a pale tint was run over the penciling, after which the stones were rendered individually, light edges being left towards the sun. The joints in shadow were strengthened in pencil. The light joints in Sketch 2 (*B*) were ruled with the pen, over pencil lines, in Chinese white slightly tinted with yellow. The same pigment was used for the highlights at *C*. The pencil was employed for the dark rulings at *A* and *B*, while at *C* the shadows were ruled with gray-violet water color before the white was applied. At 3 (*B*) the tiny darks of the joints were done with a sharp, hard pencil after the whites were ruled with the pen. Sketch 4 explains itself while Sketch 5 is included mainly to show that the reader should experiment with many effects in order to realize fully how diversified such appearances can be.

A careful turning of our pages will reveal many other effective stone indications. Cruess' painstaking and sunny study, Plate 112, and Yewell's masterly rendering, Plate 113, show the important part that stone representation can play in rendering problems. See also the indications by the author in Plates 116, 118, 119, and 121. Study these plates carefully.

A problem which the renderer often encounters, especially when dealing with interiors, is the treatment of marble or other stonework of veined or mottled character. The customary solution is to mingle either transparent or opaque pigments, or both, on moist paper, somewhat after the manner of the middle sketch in the bottom row, Plate 21, page 80. The veining is done with pencil, pen, or brush. When such stonework is of high polish, strong reflections are often mirrored in its surface. Observation of actual materials of this type gives the necessary hints as to treatment. Plates 185, 186, and 191 show good indications.

BRICKWORK Like stonework, brickwork varies greatly in effect according to the size, shape, color, and texture of the bricks, the manner of laying, the angle from which viewed, the direction of light, etc. The kind of joint and mortar also makes a decided difference. Actual brickwork is perhaps the best teacher of appearances. The scale of one's drawing has much to do with the method of rendering. Customarily it would not be possible, even if desirable, to represent all the brick courses of a building at correct scale, so it is the common practice to indicate brickwork in a somewhat suggestive manner, trying to give an impression of the whole rather than exact courses or separate bricks. Yet there are no rules. At 1, Plate 117, we have a typical small scale indication of brickwork of somewhat rough texture. This method is perhaps better explained by the chimney shown in color in the example on Plates 127, 128, and 129. It is generally a mistake to make the mortar joints in brickwork indications too light; they will attract too much attention. On the other hand, the penciling of the brickwork, whether freehand or instrumental, should not be too dark (especially if the bricks are meant to be light), or it may gray and muddy the effect. Colored pencils are some-

WATER COLOR BY FRANCIS H. CRUESS OF HIS DESIGN FOR A STUDIO ON ESTATE AT STAMFORD, CONN.

A little body color was combined with the transparent pigments

RENDERING IN WATER COLOR BY J. FLOYD YEWELL, NEW YORK COUNTY COURT HOUSE, ALFRED HOPKINS, ARCHITECT

The stonework has been treated with more than customary care. Original, 21⅜" x 29¾"

1 COURSED ASHLAR (DARK JOINTS)

FIRST STAGE (PENCILLED AND LIGHT TINT APPLIED)

FINAL STAGE (A FEW STONES "PICKED OUT" IN COLOR

NOTE EDGES LEFT LIGHT AND PENCILLING ACCENTED

2 COURSED ASHLAR (LIGHT JOINTS)

FIRST STAGE (PENCILLED AND LIGHT TINT APPLIED)

FINAL STAGE (TINTED, AND RULED JOINTS ADDED)

SHADOW LINES APPLIED BEFORE JOINTS WERE ADDED

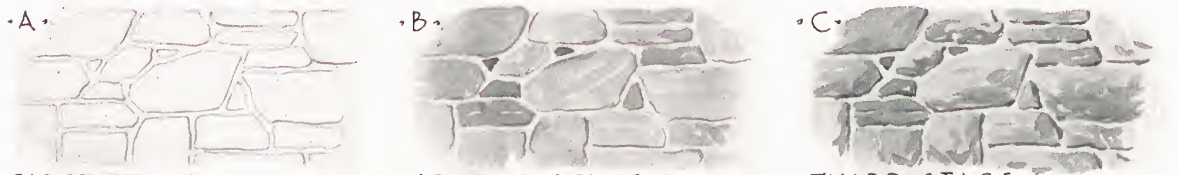
3 BROKEN ASHLAR (THREE TREATMENTS)

SHOWN WITH DARK JOINTS (PENCILLED)

SHOWN WITH LIGHT JOINTS (RULED WITH OPAQUE)

PENCILLED JOINTS (EDGES HIGHLIGHTED WITH BRUSH)

4 UNDRESSED RUBBLE (LAID AT RANDOM)

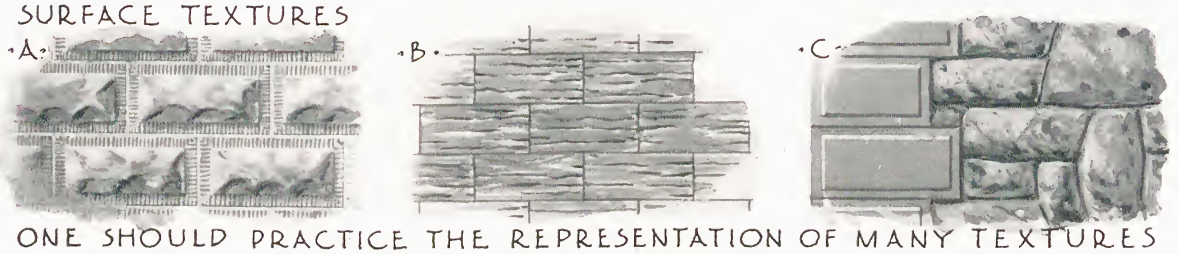


FIRST STAGE (SKETCHED FREEHAND AND TINTED)

SECOND STAGE (STONES "PICKED OUT" IN COLOR)

THIRD STAGE (SHADOWS ADDED, STONES MODELLED)

5 SURFACE TEXTURES



ONE SHOULD PRACTICE THE REPRESENTATION OF MANY TEXTURES

IT IS WELL TO MASTER SUCH DETAILS ONE AT A TIME

Search through our plates for many treatments of stone

times substituted for the black as a preventative.

At 2 we have instrumental penciling instead of the freehand: on large paper areas this is usually more rapid and is often better, too, where brick surfaces are smooth and uniform.

Sketch 3 pictures a method quite popular in elevation work, the ruling pen having replaced the brush. At *C* a colored pencil was dragged over the surface to kill the mechanical effect: also a few shadows were penciled. The ruling pen was again used in Alfred T. Granger's elevation rendering, page 313. Ruled indications are less practical where there is sharp perspective convergence.

Often wash alone (generally of deposing type) does for the brickwork, as in Cecil Briggs' rendering, page 317. Again, free suggestions like those at 4, Plate 117, are the best. Plate 116 shows similar ones at 6 and 7.

Now and then the renderer needs to work at large scale and finds these suggestive treatments insufficient. It may even prove necessary to draw individual bricks as at 5, Plate 117, and 3, Plate 116. In still another method, almost too mechanical and conspicuous, the whole surface is washed with a bricky hue and the joints are ruled in opaque white.

The reader should look through our pages for additional examples. Francis Swales' rendering, Plate 115, shows very clearly the painstaking care that is sometimes given to brickwork and other architectural detail. This drawing was laid out in pencil on mounted Steinbach paper and rendered in water color.

CONCRETE AND STUCCO These materials, when plain, are comparatively easy to represent. The renderer has only to catch the correct value and hue for each area and give a bit of suggestion of its granular surface. When large areas seem too uniform they can be developed texturally (perhaps with sandpaper, or some of the sediment washes discussed in Part I), or broken with tree or cloud shadows, etc. Our volume shows many examples.

CLAPBOARDS AND SHINGLES (WALLS) These are also quite simple. When light, their treatment is much like that of stucco, with the addition of lines to represent the butts or shadows of the courses. These lines may be freehand or instrumental, and in pencil, paint, or ink. If correct in spacing and convergence they will go a long way in themselves towards producing a satisfactory effect. In the author's drawing, page 262, every clapboard was penciled. Frederick R. Witton, page 281, presents a more suggestive treatment. Look for other examples. When walls are shingled it is seldom advisable to emphasize the vertical joint lines. We shall speak of shingled roofs in a moment.

OTHER MATERIALS As the little details to which we next turn picture representations of slate, window glass, etc., we shall give such things no further attention just now except to advise the reader to experiment with them for himself. We shall offer no numbered exercises in Part II, leaving each individual to practice according to his needs.

CHIMNEYS Sketches 1, 2, and 3, Plate 116, demonstrate in progressive stages a method of representing brick (and roof shingles) at comparatively large scale. Let us point out again that while this method of rendering each individual brick is occasionally necessary, and is natural to one trained in drafting, it is not as pleasing, many times, as are suggestions like that at 7—here, too, the shingles are simply and freely indicated. A brick treatment such as we picture at 6, in which the freehand pencil line plays quite a part, is also pleasing when the subject will permit it. Free treatments are often advisable in the case of stone chimneys, too, though there are problems where it proves better to render almost every individual stone, at least on certain areas. See Sketch 5, as well as the extremely realistic treatment by Francis H. Cruess, Plate 112. You should also study the chimney pot in this latter example, incidentally, for it is well handled, as are many other details. Sketches 4 and 8, Plate 116, present plaster chimneys, the former very rough. Note the tile.

Not the least interesting thing about the sketches on Plate 116 is the variation of hue in the skies and trees.

ROOFS Plate 118 shows plainly that roofs do not all look alike. The sketches are mainly self-explanatory. For shingle and slate (unless the latter is very rough) one general treatment will ordinarily do, though slate usually is laid in wider courses.

Most manufactured shingles, especially if thin, have so little aesthetic character that the renderer often tricks them up a bit, destroying their offensive mechanical regularity.

WINDOWS There is no one common detail which requires so much care in delineation as the window. Certainly there is no other detail which offers equal variety in appearance.

PORTION OF RENDERING OF HOTEL VANCOUVER BY H. C. WILKINSON AND FRANCIS S. SWALES, ARCHITECT

Such detailed handlings are now and then necessary. The entire drawing measured 34" x 26". Original, this portion, 8¾" x 11"

1

FIRST STAGE
PENCILLED AND TINTED

2

SECOND STAGE
SHADOWS AND DETAIL ADDED

3

THIRD STAGE
FINAL TOUCHES ADDED

4

AN ITALIAN SUBJECT
SHOWING TILES AT LARGE SCALE

5

A COLONIAL EXAMPLE
IN NATURAL STONE

6

AN ENGLISH COTTAGE
NOTE FREE TREATMENT

7

A SKETCHY TREATMENT
DETAIL MERELY SUGGESTED

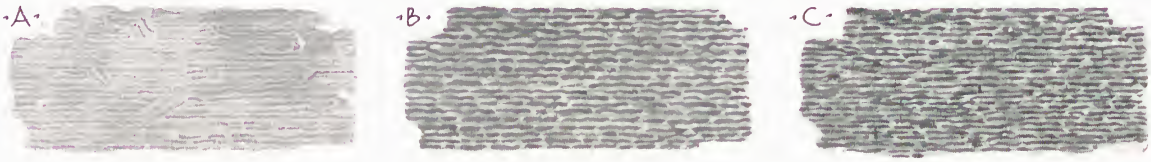
8

AN INFORMAL SUBJECT
RENDERED WITH FREEDOM

CHIMNEYS OFFER SPLENDID POSSIBILITIES FOR VARIETY OF PRACTICE

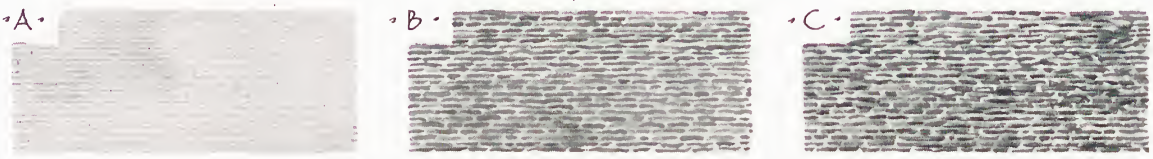
Observe that even the skies are of variegated hue

1 BRICKWORK AT SMALL SCALE (FREEHAND PENCILLING)



FIRST STAGE (PENCILLED AND LIGHT TINT APPLIED) — SECOND STAGE (WAVY BRUSH STROKES ADDED) — THIRD STAGE (A FEW BRICKS "PICKED OUT")

2 BRICKWORK AT SMALL SCALE (INSTRUMENTAL PENCILLING)



FIRST STAGE (PENCILLED AND LIGHT TINT APPLIED) — SECOND STAGE (WAVY BRUSH STROKES ADDED) — THIRD STAGE (A FEW BRICKS "PICKED OUT")

3 BRICKWORK DRAWN WITH RULING PEN

FIRST STAGE (PRELIMINARY TINT) — SECOND STAGE (PEN WORK COMPLETED) — AT LARGER SCALE (NOTE SHADOWS IN JOINTS)

4 SOME BRICKWORK INDICATIONS

EXCEPTING IN THE FOREGROUND SUCH SUGGESTIONS ARE OFTEN SUFFICIENT

5 BRICKWORK AT LARGER SCALE

THE BRICKS ARE OFTEN FULLY DRAWN — FLUSH JOINTS SHOWING NO SHADOW — WITH RAKED JOINTS THE SHADOWS BECOME IMPORTANT

IT IS SELDOM POSSIBLE TO DRAW BRICKWORK AT EXACT SCALE

One should therefore learn various ways of indicating it successfully

The best way in which the student can come to a full realization of this is by studying actual windows as he sees them all about him. Not only do they differ in form and character, but the glass is responsible for an astonishing diversity of effects. Sometimes it is invisible, or practically so, and the window could be indicated as though the sashes were unglazed, the shades, draperies, and the like showing plainly. Again, the glass so catches the light that it is impossible to see through it; instead it acts as a mirror, reflecting the sky, buildings, people, etc. These two conditions we see illustrated in Sketches 3 and 4, Plate 119. The former was painted as though there were no glass: the latter exhibits a reflection of the sky, vines, and roof overhang. Frequently these qualities of transparency and reflecting capacity are combined, even in a single window, and in the case of a vertical range of windows, as in a tall building, it is very common to see the glass of the upper stories reflecting blue sky or clouds, that half or two-thirds of the way down imaging opposite buildings, while that nearer the street exercises its characteristic of transparency.

Much depends on direction of light and the angle from which the glass is viewed.

The sketches on Plate 119 require little explanation. Those at 1, 2, and 3 demonstrate progressively a rendering method frequently used. Note the careful penciling at 1, the darks added at 2 with both brush and ruling pen, and the final ruling at 3 of opaque white (slightly yellowed) for the sash bars. Shadows are highly important in such work. Here the light was from the left, above. Note the sash shadows on the shades and curtains. In Sketches 3 and 6 the tone within the room contains some dull orange: this gives a feeling of depth and transparency. The open casements in the latter sketch reveal a bluish glass hue, yet we can see through the glass.

It is not the custom in rendering a building to finish one window (or like detail) completely, then going to the next. Instead, the renderer performs a single operation on every window in turn, then another operation, and so on—thus saving time and securing uniformity of effect. The ruling pen highlights are generally added last—a fair amount of pigment must be mixed to a creamy consistency: the pen will require frequent wiping.

DOORWAYS Though doors and doorways are always prominent features in architectural renderings, often forming centers of interest, they involve no new principles.

SHADOWS We spoke in Part I of the importance of correct shadow representation. Perhaps there is no single thing in the field of architectural rendering more subject to dispute than methods of treating shadows, particularly as to hue. Some artists use for their shadows dark values of the normal hues of the surfaces on which they fall, maintaining that this is logical, as shadow is merely absence of light. If, for instance, it was desired to paint a shadow on a brick and timber wall, as at 4, Plate 121, it would be painted like the wall in light, only darker. This was the method actually followed here. Other artists make their shadows more blue or violet, according to a thought expressed in Part I that areas of a given surface in shadow often appear to an extent complementary to areas in light, due mainly to simultaneous contrast. Here again is logic, for it is certainly true that where blue or violet are used in shadows, adjacent areas in light generally appear all the brighter because of the complementary contrast. We see indications of cool color in the shadows of Sketches 6, 7, 8, and 9, Plate 121, illustrating this point. Regardless of color, the sharper the shadow against the light, even when exaggerated by sudden gradation as at 5, the brighter that light will appear.

SHADOW VALUES It is not only the hues of shadows that are important: their values must be right. Read the notes on Sketches 2 and 3.

SHADOW SHAPES In earlier chapters we spoke of shadow shapes as form revealing. Sketch 1 gives us examples of this. The shadow on the door helps us to judge not only the angle at which the door is open, but the relief of the panels. From the triangular shadow beneath the shutter we know it is not parallel with the wall. The shadows of the steps emphasize their shape and projection.

REFLECTED LIGHT Practically all shadows are affected more or less by light (or color) reflected into them. This shows plainly in 6, 7, and 8 with their light soffits, made so by light thrown from below. Often such reflection is strong enough to cast reversed shadows: see those of the mutules, 5 and 8.

So much regarding some of these common details. As to their treatment in opaque color, pastel, etc., there are many pointers or illustrations scattered among our pages.

1 SHINGLE (OLD OR IRREGULARLY LAID)

·A· FIRST STAGE (PENCILLED AND LIGHT TINT APPLIED)

·B· SECOND STAGE (A FEW SHINGLES DARKENED)

·C· FINAL STAGE (THE BUTTS DARKENED, ACCENTS ADDED)

2 SLATE (IRREGULAR)

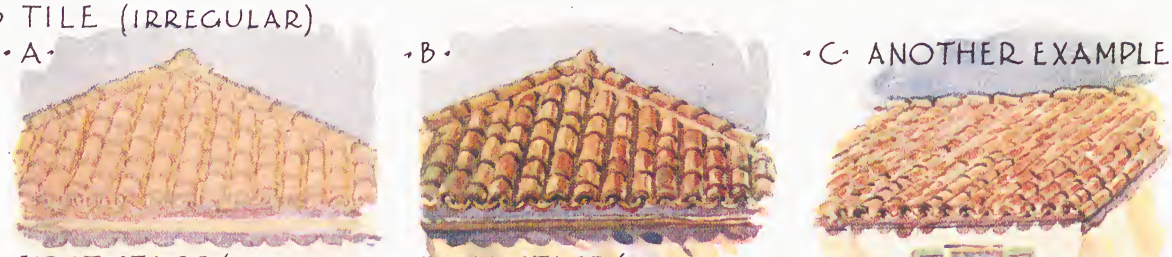
·A· FIRST STAGE (PENCILLED AND LIGHT TINT APPLIED)

·B· FINAL STAGE (ACCENTED AND A FEW SLATES COLORED)

·C· ANOTHER EXAMPLE

FLAT OR "SHINGLE" TILES GIVE MUCH THESE SAME IMPRESSIONS

3 TILE (IRREGULAR)



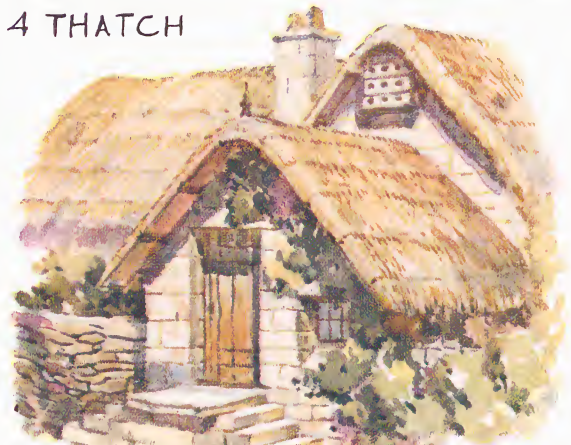
·A· FIRST STAGE (PENCILLED AND LIGHT TINT APPLIED)

·B· FINAL STAGE (THE BUTTS DARKENED, ACCENTS ADDED)

·C· ANOTHER EXAMPLE

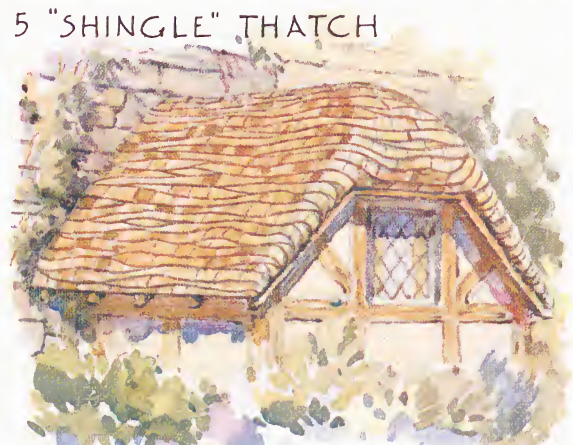
THE EFFECT CHANGES AS THE ANGLE OF VISION SHIFTS

4 THATCH



SUCH ROOFS SHOW GREAT VARIETY

5 "SHINGLE" THATCH



NOTE ROUNDNESS OF ALL CORNERS

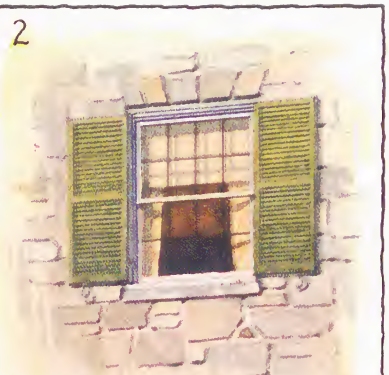
ROOFING MATERIALS TAKE TIME BUT PRESENT NO GREAT DIFFICULTIES

Often they are pictured somewhat larger than their actual scale

1

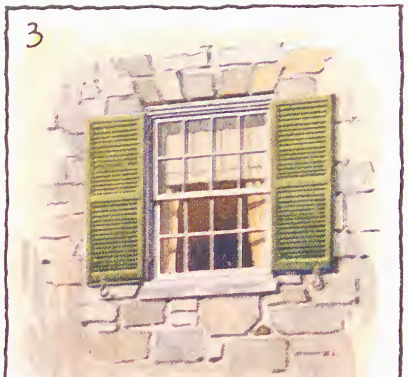
FIRST STAGE
OUTLINE AND FIRST WASHES

2



SECOND STAGE
SHADOWS AND ACCENTS ADDED

3

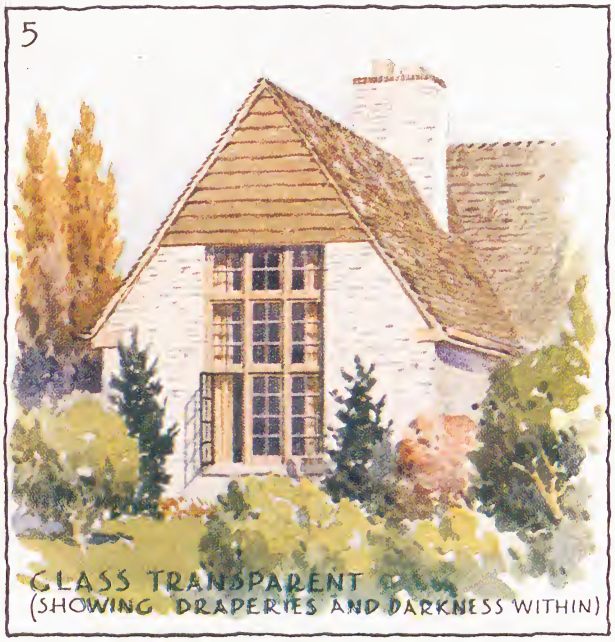


THIRD STAGE
OPAQUE HIGHLIGHTS ADDED

4

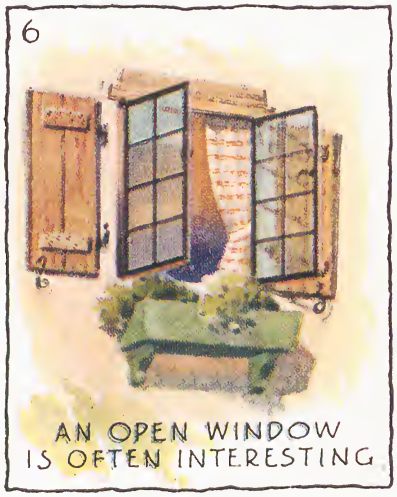
GLASS ACTING AS REFLECTOR
(NOTE REFLECTION OF VINES AND SKY)

5



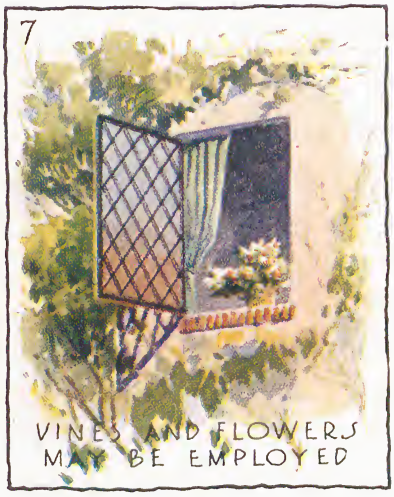
GLASS TRANSPARENT
(SHOWING DRAPERIES AND DARKNESS WITHIN)

6



AN OPEN WINDOW
IS OFTEN INTERESTING

7



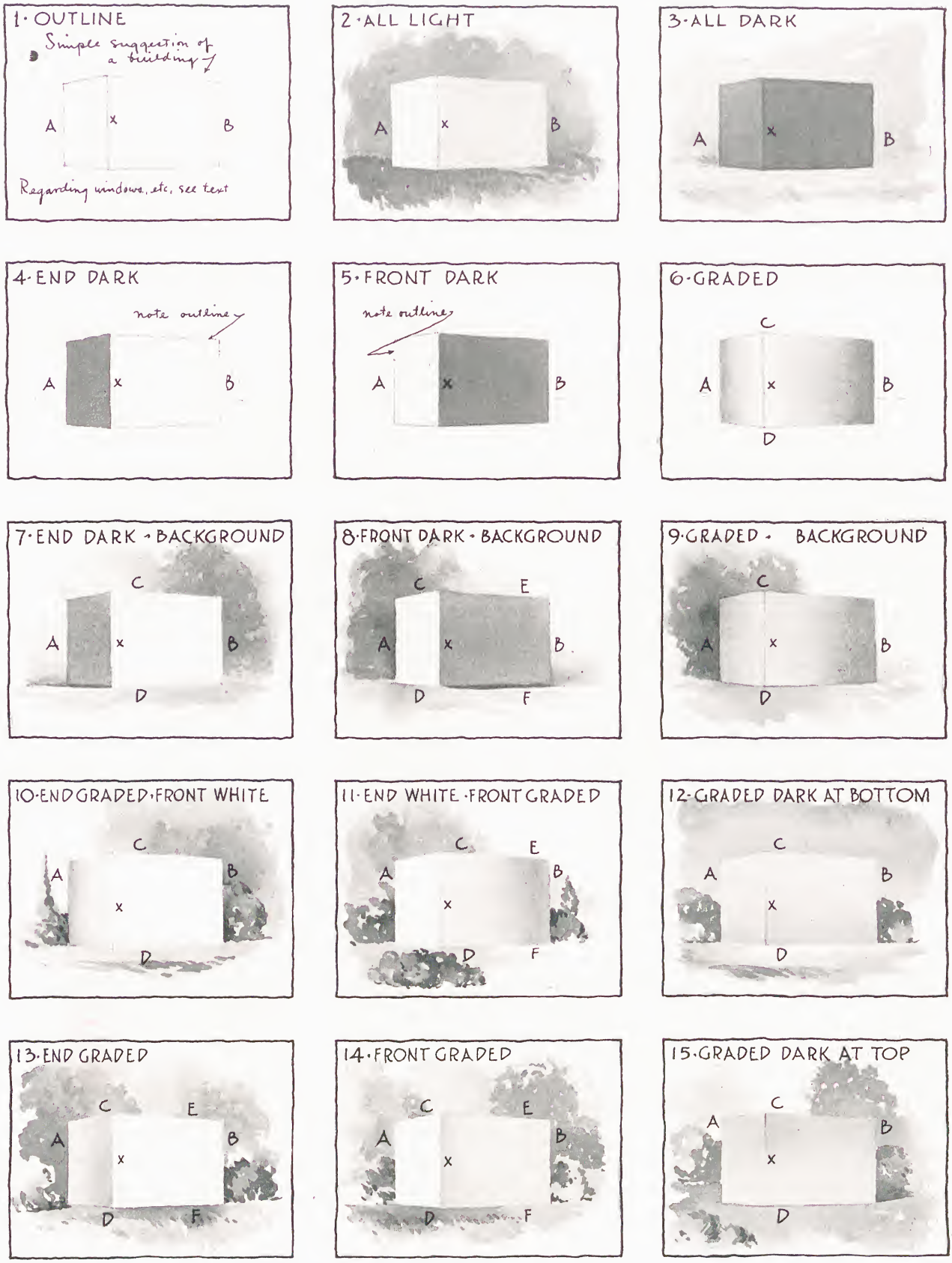
VINES AND FLOWERS
MAY BE EMPLOYED

8

AWNINGS OFFER A
CHANCE FOR COLOR

GLASS SOMETIMES APPEARS TRANSPARENT: AGAIN IT ACTS AS A MIRROR

Quite a bit of opaque highlighting was done in these examples



THE RENDERER LEARNS TO MAKE VALUES HELP HIM IN MANY WAYS

He builds contrasts where they will best serve his ends

CHAPTER II

RANDOM THOUGHTS ON COMPOSITION

SHOWING HOW TO COMPOSE ORIGINAL RENDERINGS

Rarely does the delineator meet with more than minor or temporary difficulties in the representation of such parts of buildings as we discussed in the last chapter. But it is one thing to do individual details satisfactorily, and quite another to render complete buildings, together with their settings, especially when working from memory or imagination as the renderer usually has to do. The beginner, in his zeal to portray a subject adequately, often over-renders many of his details at the expense of the subject as a whole, the result being restless and fussy. He must learn that a satisfactory rendering is not so much a collection of many separate parts, each carefully done, as a homogeneous unit every portion of which has been given exactly its proper share of attention in relation to the whole and to every other portion. In other words, it is a composition. Though we can unfortunately give the reader no foolproof rules for composition, we shall briefly discuss some of its qualities, such as unity, emphasis, and balance, first offering pointers on the treatment of buildings in mass, stripped bare of detail.

At 1, Plate 120, we show diagrammatically a simple building. Let us assume, to make the problem more real, that this diagram stands for such a complete outline drawing of a building (doors, windows, and all) as the delineator commonly prepares in pencil on his white paper as a layout for a typical rendering. Though such an outline study often gives, as it stands, a fairly adequate interpretation of the structure, it has little force to attract or hold the eye (no carrying power), offers but meagre suggestion of space and substance, and tells us nothing of the color scheme. One of the renderer's problems is to learn to make his buildings stand out from his paper so as to be seen and understood at a glance, a thing which he can do by means of well-arranged contrasts of light and dark or of color. For the moment we shall neglect color in order to concentrate on value contrasts. Let us see how the renderer sizes up his outline and plans the contrasts which will give it this desired life.

If the proposed structure is to be of light materials, as a majority of buildings are, the obvious thing to do is to leave it quite light (the later treatment of its details would be sure to darken it somewhat) against a dark background: this general scheme of composition we illustrate at 2. A building of dark materials, contrarily, is often contrasted with a relatively light background (3). Again, the renderer takes advantage of natural contrasts of sunshine, shade, and shadow. At 4, for example, the end of the building, assumed to be in shade, was rendered dark, and at once stands out plainly against the light surroundings. But the front here has no prominence, depending wholly on its outline. If we reverse the light and shade, as at 5, the front gains strength but the end loses. Schemes 4 and 5, then, are not satisfactory as they stand. At 6 the near corner (x) is left light, and both end and front are graded darker at A and B. This scheme has possibilities, but gives no contrast at C and D. Schemes 4 and 6, or 5 and 6, might be combined to advantage. But perhaps the best way to overcome the faults of 4 is illustrated at 7, where sky, foliage, and ground tones, plus the end tone, throw the front into contrast. Here we have a good scheme for a rendering, which, with variations, has been used hundreds of times. At 8 the faults of 5 are similarly corrected, while at 9 we see what foreground and background tones, developing contrasts at C and D, will do to Scheme 6. Note that at 7, 8, and 9 the building is everywhere dark against light or light against dark, an arrangement which is customarily desirable.

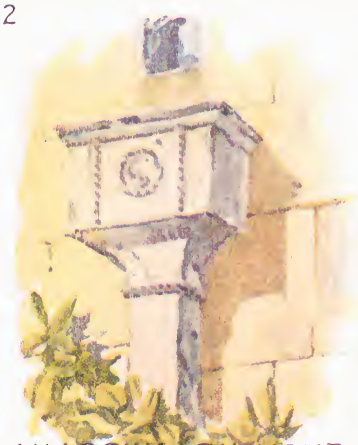
The remaining diagrams on this page picture further uses of graded tones for creating contrasts where wanted.

We can summarize the lesson of this page by saying that the renderer learns to take ad-

1

SHADOWS ASSIST IN EXPRESSION OF FORM

2



SHADOWS ON LIGHT SURFACES ARE LIGHT

3

ON DARK SURFACES SHADOWS ARE DARK

4

NOTE THE VARIETY OF VALUES IN THE SHADOW

5

FORCING SHADOWS BY MEANS OF GRADATION

6

FORCING SHADOWS BY CONTRAST IN COLOR

7

REFLECTION OF LIGHT MODIFIES SHADOWS

8

REVERSED SHADOWS CAUSED BY REFLECTION

9

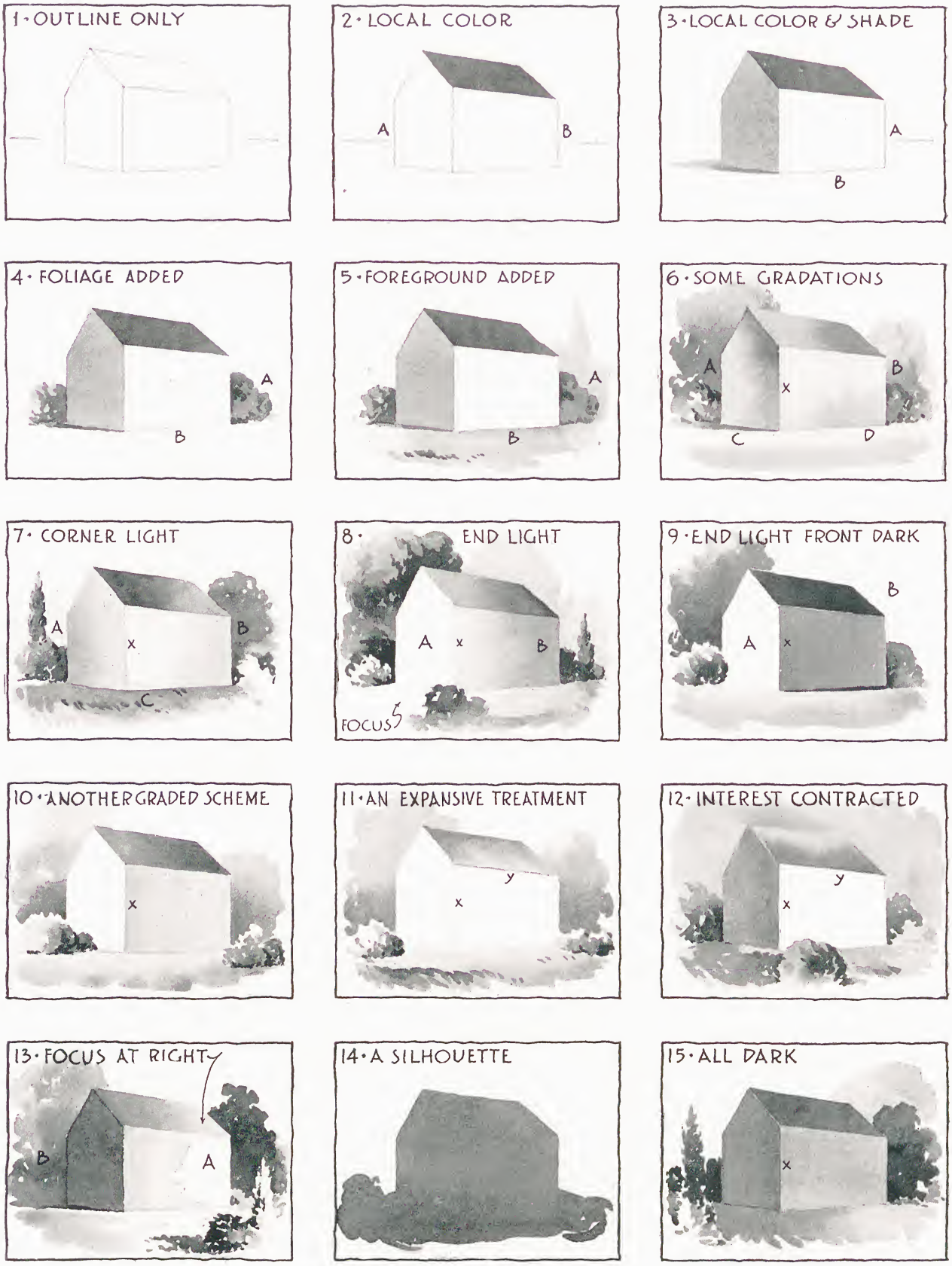
TRANSPARENCY GAINED FROM USE OF DARK ACCENTS

IN WORK FROM THE SMALLEST TO THE LARGEST, SHADOWS ARE HIGHLY IMPORTANT

Not only do they suggest sunlight but they express form

PASTEL SKETCH STUDY BY FREDERICK R. WITTON FOR A PROPOSED EDUCATIONAL GROUP, McLAUGHLIN AND BURR, ARCHITECTS

Contrasts of hue are as necessary as contrasts of value. Original, 40" x 30"



BOTH LOCAL VALUES AND LIGHT AND SHADE TONES ARE UTILIZED

Any area can be emphasized or thrown into subordination

vantage of natural contrasts, whether due to local tones of materials or to light and shade, so manipulating them as to bring out his architecture. The beginner often fails to realize that such contrasts are deliberately composed.

Frederic C. Hirons' sketch on Plate 125 shows a practical application of this matter. Here the main façade was light. In order not to break up this area disastrously, part of the window glass and other details were left light: the black shadows and reflections within this light merely serve to accentuate it, as do the surrounding tones on every hand. Thus a strong center of interest has been created—a center of light (punctuated by brilliant accents) surrounded by darks. Some renderings exactly reverse this scheme so far as major masses are concerned. See again the aqueduct drawings, page 99, as a reminder of how much control the artist can exercise over value arrangement.

Plate 123 redemonstrates much of this. With the roof tone applied to the outline (1), as at 2, the roof gained prominence: the shade and shadow tones at 3 strengthened the end: the bush at *A*, Sketch 4, brought out the front: the foreground, distant trees, etc., at 5, completed the whole. Thus is developed a very common rendering scheme, subject to numerous adaptations. At 6 and 7 we see softer contrasts arrived at through gradation. At 8 the attention is focused at the left: at 13 it has been shifted to the right. The foreground bushes in 8 and 13 help to set the building back. We can expand the interest as at 11 by avoiding strong contrasts of tone as at *x* and *y*: we can also contract the interest as at 12. This sheet suggests only a few of hundreds of possibilities for the treatment of even the simplest structure. Complex structures offer still greater opportunities for variety.

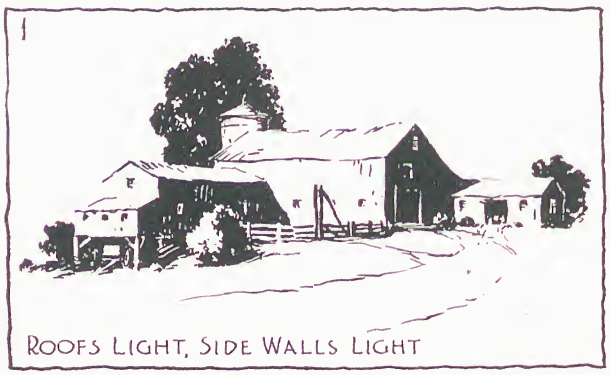
It is the obvious duty of the renderer to express each building brought to him for representation as clearly and as advantageously as he honestly can: by making little sketches such as these he learns how to manage his leading values. Another helpful exercise is to lay tracing paper over photographs of existing buildings, making groups of quick sketches—charcoal or soft pencil will do—trying just such stunts as we have suggested here. The detail should be forgotten. We are trying to make plain that important as color and technique are, value composition is extremely vital. It can be learned only by experimentation.

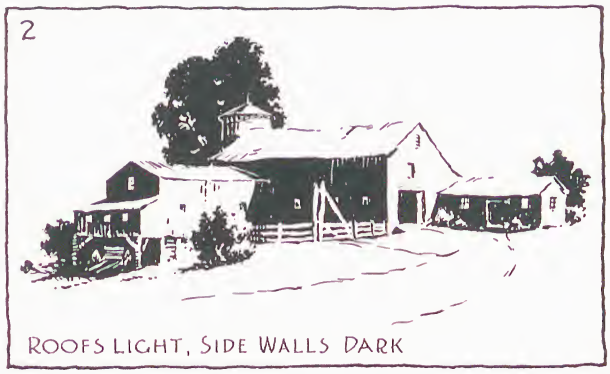
One of the best possible types of sketches to make at the beginning of this practice is exemplified by Plate 124. Subjects of greater architectural significance could of course be substituted, but the general handling should be approximately the same as here, black (it can be brushed on) being used for all the dark values and white for all the light. If one can learn to spot these strong blacks so they compose well (form a pleasing and expressive pattern or design) he will have learned an important lesson. The sketches can be done on tracing paper placed over the photograph, or, better, from actual buildings. The lower sketches here—those showing the gray—are somewhat more realistic modifications of the black and whites above. It would be helpful to do some of these, also. In such work one should express as much as possible with a few tones. This teaches simplicity: the beginner's renderings are nearly always too complex.

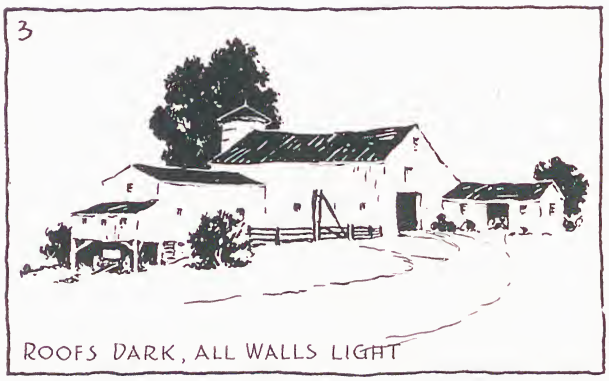
CONTRASTS OF HUE If one hue is brought against another, even of like value, there is contrast. The more unlike these hues are—the farther apart on the color wheel—the greater the contrast. Analogous colors are less useful to us, therefore, when we are trying to build contrasts as a means of emphasizing a building or some feature of it, than are complementary ones. If we wish to force a red building into prominence we surround it with green trees: similarly, we throw an orange or yellow structure against a blue sky or contrast it with violet shadows. This should all be so obvious in view of our instructions in Part I that further discussion seems unnecessary. We remind the reader, however, that the strongest contrasts at the artist's command involve not only value and hue but also that other quality of color, intensity; even textural contrasts are frequently brought into play.

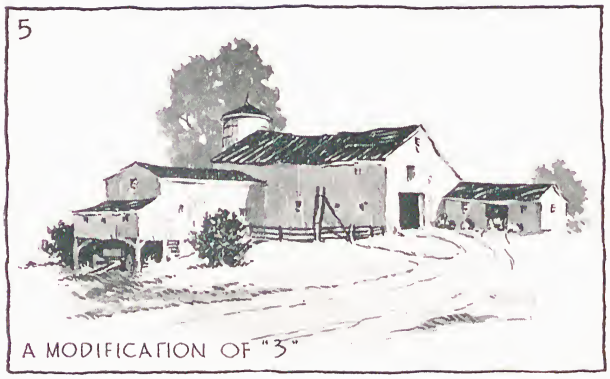
COMPOSITION TERMS Though it is not our purpose to go into the theory of pictorial composition, we should perhaps offer a word on the meaning of some of the common terms.

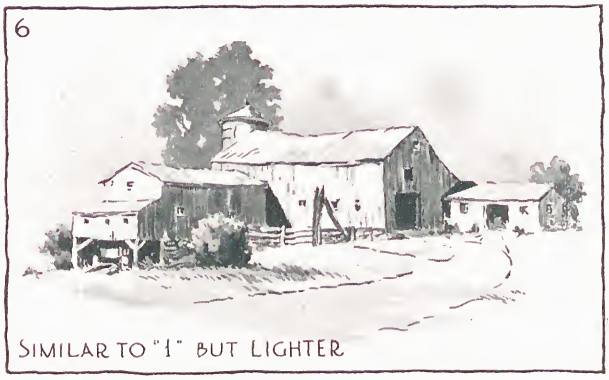
"Unity" explains itself. A rendering, like any work of art, should be a homogeneous whole. It should contain only related parts, and these should be merged to form a complete unit, giving a harmonious effect. The eye should not be irritated by irrelevant, meaningless or over-insistent details. If a rendering has such details or lacks harmonious adjustment of any of its constituent elements we say it lacks unity. If even a single element

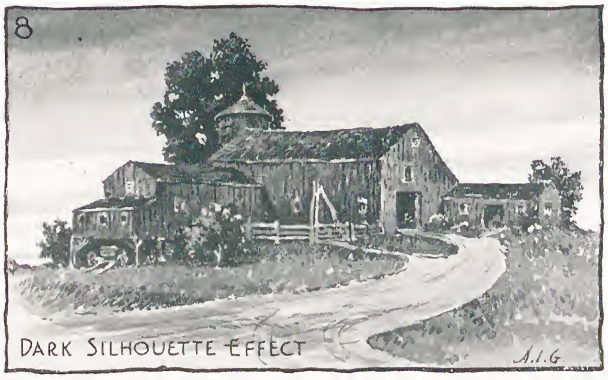












THROUGH EXPERIMENTS WITH CONTRASTED VALUES ONE LEARNS MUCH

BLACK AND WHITES TEACH THE IMPORTANCE OF VALUES

From simple subjects like these one can learn essential lessons

is incongruous or not properly subordinated to the whole, unity is impaired. A composition is particularly unfortunate, as we have several times said, when it has two or more conflicting centers of interest.

"Balance" is another word frequently used in referring to works of art; again the meaning is largely self-evident, for if a drawing is to have balance it must be in equilibrium or equipose. If we place a mass which is dark or of some given color on one side of a drawing we must counteract it with some compensating mass or masses of similar attentive value on the other. These need not be the same in size, color, or placement, but must play their part in maintaining the equilibrium of the whole. If a single detail attracts too much attention it forces the entire drawing out of balance. Either the offending detail must be toned down or the rest of the drawing strengthened. It takes very little to destroy the balance of a sketch or rendering—a conspicuous tree or automobile, an airplane against the sky, a person in an unusual place or doing an unusual thing. An excellent way to judge balance is to reflect the finished picture in a mirror: thus viewed in reverse the eye, too familiar with its normal appearance, is more likely to detect any lack of equilibrium.

Another attribute of a good composition is "emphasis." We have already said a lot about this in Part I: study in particular Chapter XXVI.

PRELIMINARY SKETCHES There is probably no kind of work in which preliminary sketches are of greater importance than in architectural rendering. Renderings are never alike—note the variety of our illustrations—which means that regardless of how much one may know of the theory of composition, it is only through trial sketches that he can obtain schemes productive of best results. This is especially true in the case of the beginner, though even the professional often makes several before starting his final rendering. These are usually done on tracing paper placed over the pencil layout. One therefore wastes no time blocking in proportions. With a soft pencil or charcoal or, if color is wanted, with pastels or other colored crayons all the leading elements are decided upon. This is a critical period, and one must work thoughtfully, disposing all values (including such contrasting ones as we have stressed), planning the color scheme, determining the direction of the light, proper treatment of surroundings, etc. If his first trial sketch seems disappointing, a second should be made, and perhaps a third. The best is then selected, sprayed with fixatif, and hung in plain sight as a guide for the final rendering. Though this final should show far greater finish, it should retain, so far as possible, the vitality and spontaneity of this sketch. The beginner does not seem to realize that he will save hours if he takes the trouble to make even a single reasonably accurate preliminary study for each rendering which he undertakes, yet this is true, for he can advance his final work with greater certainty. Some renderers prefer to make their preliminary studies at small scale—sort of thumb-nail sketches or marginal notes. The purpose is of course the same.

So this is the common and probably the most practical way of learning to compose: additional suggestions will be found in the next two chapters.

Though the remarkably expressive drawings by F. C. Hirons and Frederick R. Witton, Plates 125 and 122, are not actually preliminary studies for renderings, they are so similar in general character to many preliminaries that we show them here hoping they may serve as models for such work.

LITHOGRAPHIC CRAYON STUDY BY FREDERIC C. HIRONS, ARCHITECT

The values here have been handled to excellent advantage

CHAPTER III

CUTOUTS: AN AID TO COMPOSITION

PRESENTING A PRACTICAL STUNT OF REAL VALUE

We now introduce a little stunt which has proven so useful in the author's classes, and even in his own work, that it seems worth passing on.

The rendering of buildings is generally far easier to the man of architectural training than is the composition of their settings, especially when of landscape character. Even if he can picture individual trees and like details with a fair degree of success he still has difficulty in arranging them to advantage. All too often he composes by what we might call "addition." He gets the rendering of the building under way near the center of the paper. Then he discovers a fine big empty space, and in goes a tree. That is addition. This makes another area seem bare and in goes another tree. Then he gradually fills such smaller areas as remain with bushes, tree shadows, etc. Finally the sky looks vacant and clouds are shoved in, and a couple of drooping branches bearing banana-shaped leaves to fill the corners. With a happy smile he gazes at his finished product. Rendered by addition!

Far better for one to try to compose a unified setting by means of such preliminary studies as we discussed in the last chapter. Or he can extend this method, as follows.

Let us suppose that a large foreground tree is wanted. On a sheet of very transparent tracing paper placed over the instrumental layout he can sketch a tree in full values, and perhaps in color (pastel or colored crayon). Then he can shove this paper around, trying the effect of the tree in various positions until it relates well to the architecture and contributes to the aesthetic appearance of the whole instead of merely occupying some conveniently vacant spot. When this tree has been well placed, he can similarly sketch, on another sheet of tracing paper laid over the first, other trees or like features of different type or scale, shifting them until they, too, look just right. Sometimes even third and fourth sheets are added, or new sheets are substituted for some of the old. Small details like bushes may be on individual small sheets. Composition by lamination! With such sketches well located, a final study, incorporating all their most desirable features and adjusting their forms, values, and hues, can be made on still another sheet. This can be pushed far enough to become a practical guide for the final rendering. Some renderers save the best of these sheets and utilize them later when doing other similar renderings.

Cutouts such as are pictured in this chapter are merely a further development of this idea.

FIGURE 66

FIGURE 67 *A. L. Guptill, A.I.A., Architect*

FIGURE 68

FIGURE 69

FIGURE 70

FIGURE 71

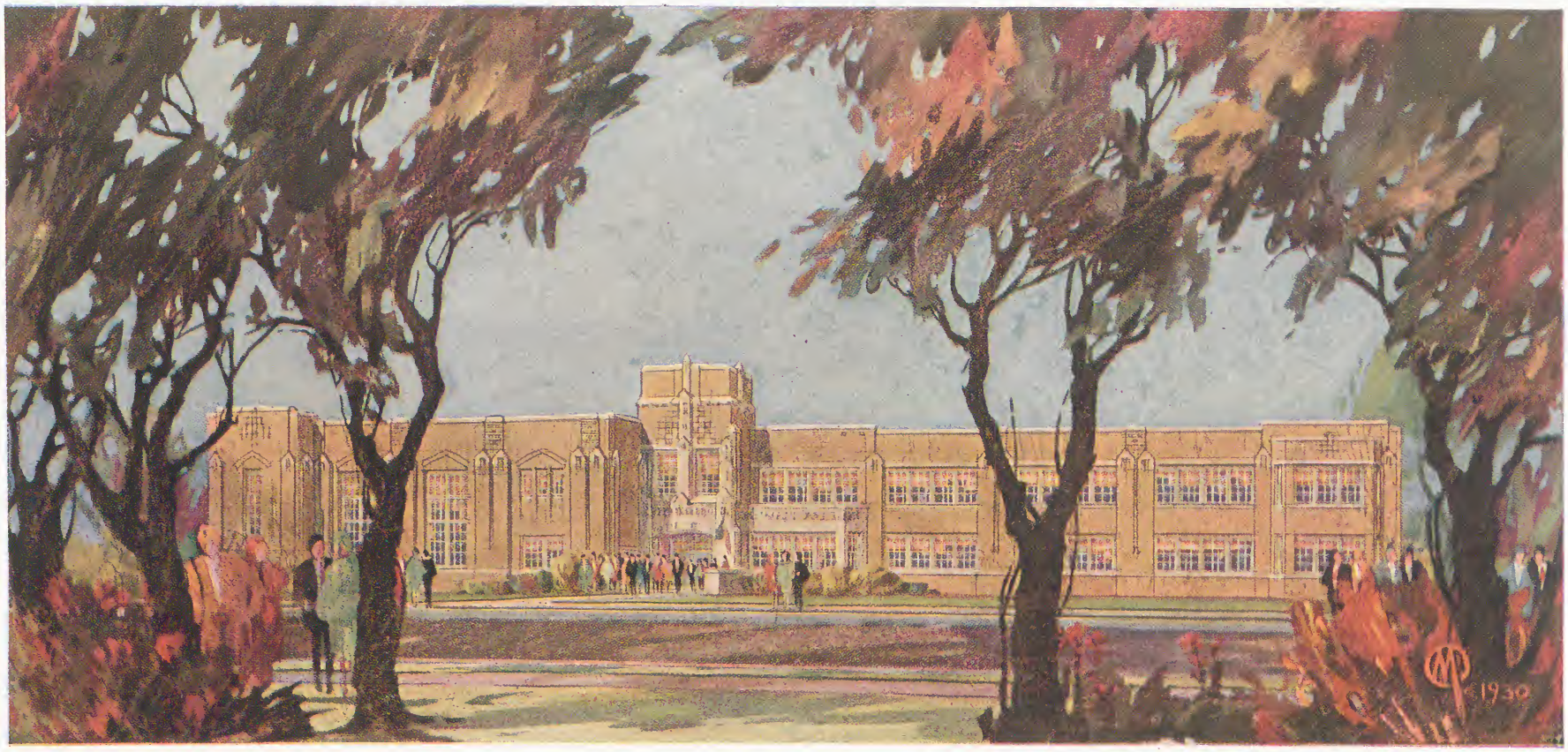
In leisure time one makes renderings on ordinary water color paper (fairly heavy but not mounted board) of a variety of trees, bushes, and the like. These he cuts out (around the edges) and saves for future use. Later, when the initial light tones have been applied to the instrumental layout for a rendering (see Chapter IV), some of these cutouts are shoved around the paper until a pleasing and logical composition is discovered. Then they are lightly outlined on the rendering, with any necessary modifications in form to meet existing conditions, and the rendering is carried forward with them in view as a guide, such changes in value, hue, or detail being made as seem desirable.

In Figure 66 we reproduce at small scale three such cutouts. The originals were in water color and of a size well suited to the typical rendering. One needs a dozen or so of these; also some figures, autos (which will usually be out of perspective), etc. In Figure 67 we reproduce in halftone a color rendering. Though this has been brought to completion, imagine it, instead, merely an outline drawing, lightly tinted. In Figure 68, cutout *B* has been laid on the left of this drawing. In Figure 69, cutout *C* has been added at the right. For further variety, in Figure 70, cutout *C* has been moved to the left to the place previously occupied by *B*. In Figure 71, cutout *A* has been substituted for the others. In all cases the unwanted portions have been hidden with strips of white paper. Comparison of these several reproductions makes evident something of the variety obtainable by this quick means. One should note how these schemes differ in appearance, even though the original rendering remains exactly the same in every instance. He should make cutouts for himself and try them on some of his own problems. If they curl, weight them down with a sheet of glass.

Treatments like that by Yewell, Plate 67, page 162, or that by Otho McCrackin, Plate 126, could quite easily be visualized by means of cutouts, though these specific examples did not happen to be so composed.

Cutouts of entire foregrounds are sometimes convenient, showing hedges or fences, walks or streets; they will not jibe perspectively with all subjects but nevertheless can help one to obtain good compositions. For large structures, foreground shadows, masses of people and automobiles, or silhouettes of typical buildings to place at left and right as frames are useful.

Cutouts are not intended to take the place of studies but rather to help in their making.



HIGH SCHOOL, LYONS, KANSAS, BY MANN AND COMPANY, ARCHITECTS. RENDERED IN WATER COLOR BY OTHO McCRACKIN

In compositions like this, cutouts can often prove of advantage. Original, 27¾" x 14¾"

A TYPICAL EXAMPLE: FIRST STAGE

HERE THE WHOLE HAS BEEN LAID OUT IN PENCIL AND LIGHT WASHES ADDED

It is well to kill the white of the paper as soon as possible. Original, 18" x 12"

DON'T COMPLETE AN AREA AT A TIME, BUT "KEEP THE WHOLE RENDERING COMING"

The hues of the building have been distributed in the surroundings

RESTORATIONS AND ALTERATIONS TO A HOUSE IN MAINE. DESIGNED AND RENDERED BY ARTHUR L. GUPTILL, ARCHITECT

Through adjustments here and there the whole has been pulled together. Original, 18" x 12"

ALTERNATE TREATMENTS FOR THE RENDERING ON THE PREVIOUS PLATE

Though meant as preliminaries, these might do as actual renderings. Originals, each sketch, 6" x 4"

WATER COLOR RENDERING BY J. FLOYD YEWELL, KELLOGG PATTON RESIDENCE, MILWAUKEE. DWIGHT JAMES BAUM, ARCHITECT

Here the dark materials of the building have been effectively contrasted with brilliant hues. Original, 23¾" x 16"

DETAIL, REPRODUCED WITHOUT REDUCTION, OF THE RENDERING BY J. FLOYD YEWELL SHOWN ON PLATE 131

This detail clearly shows the free, wet method and rich chromatic arrangement. Original, this exact size

OPAQUE WATER COLOR DRAWING BY J. FLOYD YEWELL OF A GATE LODGE BY AYMAR EMBURY, II, ARCHITECT

By good interrelation of a few hues an adequate effect has been secured. Original, 20½" x 12½"

CHAPTER IV

RENDERING A COMPLETE STRUCTURE

WITH EACH PROGRESSIVE STEP FULLY DEMONSTRATED

Let us now consider, step by step, the development from start to finish of a typical rendering, later drawing comparisons between the result and other renderings of similar subjects. This will quite naturally necessitate occasional brief repetition of earlier instructions.

First, a preliminary word of advice. The delineator must never forget that his primary job, in making a rendering of architecture, is to express that architecture logically, attractively, truthfully, and, above all, so clearly that even the layman can tell at a glance just what was intended. Architectural rendering is not a field for evasion, ambiguity, or the practice of strange abstractions or vague conventionalities. It demands realism. If a rendering is of a proposed building—and the typical rendering is—the client wishes to know exactly how it will look when completed and viewed in its actual setting. For this reason the renderer must never slight or distort his architecture (unless this is necessary to make it *look* right), force his colors or technique unnaturally, or strive for tricky effects. Sometimes he resorts to "tricks," to be sure, but not the deceptive type, obscuring his meaning: they are merely clever indications or short cuts which enable him to produce an adequate impression with a reasonable expenditure of time and energy.

Renderings as a whole can be divided into two classes, the first sketchy and the second painstakingly finished. Paradoxically one usually acquires skill in doing the former type through doing the latter. For our present problem, therefore, we shall consider a rendering made without thought of speed, as this is the type which should receive one's first attention.

A PRACTICAL PROBLEM The author has prepared Plates 127, 128, 129, and 130 for the purpose of demonstrating as clearly as possible the progressive steps followed in making a typical perspective rendering in transparent water color. A residence was chosen for the subject since this is what the young renderer is likely to be asked to do first.

A Colonial house was selected because, with its prim completeness, it lends itself well to the painstaking treatment which we wish to emphasize.

INSTRUMENTAL LAYOUT The initial move was to lay out, from the plans, the perspective projection. An attempt was made to locate a station point from which the structure would appear to excellent advantage. Only experience can teach one to do this. If he stands too close, the perspective will be acute and perhaps distorted: if too far away, the effect will seem unnatural. A common rule is to get back far enough so the entire structure and its immediate surroundings can be included within a cone of sixty degrees, constructed with its tip at the eye and its axis on the line of sight from eye to object. This rule is based on the fact that the eye is able to see objects distinctly, without shifting, only within an angle approximating sixty degrees. Exceptions to the rule are sometimes permissible. In the case of a residence it is quite common to stand away at least seventy-five to a hundred feet. The angle at which a building is viewed is also important: one façade is usually foreshortened more than the other. Our plan here was turned to a 30°-60° angle. The height of the eye level (horizon line) must likewise be determined with care: if the completed building is customarily to be viewed from above or below it should be so drawn, though effects are ordinarily more natural when the spectator's eye is horizontally opposite a point on the structure from four to six feet above its intersection with the ground. If a building site has already been chosen, this will very likely determine all such things.

It takes some time before one comes to a full appreciation of how important this matter of point of view selection really is. Many perspectives, projected accurately enough, give wholly erroneous impressions because of faulty

RESIDENCE OF JAMES BOYD, SOUTHERN PINES, N. C., AYMAR EMBURY, II, ARCHITECT. WATER COLOR BY J. FLOYD YEWELL

Again we see that a subject can be well expressed without resort to tricks. The whole is simple and straightforward. Original, 32" x 15½"

WATER COLOR DRAWING BY HENRY R. DIAMOND OF A HOUSE BY ALEXANDER BERESNIAKOFF, ARCHITECT

Opaque poster colors were used for this pointillistic treatment. Original, 17½" x 12"

viewpoints. They are worse than useless. In the case of important projects, particularly if irregular in mass, it is advisable to lay out several small scale instrumental trial perspectives. These will show how the architecture stacks up from different points, and so will prove extremely valuable in planning the final.

In the present problem, the perspective was projected from a blue print of the ¼″ scale first floor plan, thumbtacked at the top of the board. [It is presupposed the reader knows how to do this; if not, there are many good books available explaining the process. As a small volume of value see *Perspective* by Ben J. Lubschez (D. Van Nostrand Company).]

The layout was done directly on a sheet of Whatman mounted board of cold pressed surface. This was nailed to the drawing board. Plate 127 reveals the original penciling, which was accurate and complete. A rather hard pencil was used (3H) in order to keep the paper immaculate, but care was taken not to groove the surface.

Some draftsmen prefer to construct their perspectives on tracing paper, transferring them by rubbing or otherwise to the water color paper. The final drawing in any case should be accurate and reasonably clean-cut, especially if the building is of a precise type.

With the instrumental work on the building in Plate 127 completed, including the shadow shapes, free-hand pencil lines were added for shutter slats, shingles, brickwork, etc.

COMPOSING THE SHEET Next, tracing paper was placed over the whole and the leading features of the entourage were located in pencil: these were based largely on snapshots and measurements taken at the site. In case there is no definite data the renderer must compose his own setting.

LIMITING THE DRAWING Two or three inches all around, from the extreme limits of the building to the margin lines, usually provides as much space as is needed for a suitable setting. Often less will do. Such space expands surprisingly as the rendering advances. It is sometimes advisable to render an extra inch or two in every direction, later matting the drawing down to the point where it composes the best.

PASTEL STUDY With entourage composed and margins located, a pastel study of the entire subject was made on tracing paper, the photographs proving of considerable aid. This was then fixed and thumbtacked to the wall in plain sight.

When the entourage features as determined by this sketch had been redrawn on the Whatman board it was removed from the large drawing board to which it had been fastened for the instrumental layout, and nailed to a much smaller drawing board which permitted easier manipulation. Next, the freehand penciling which is visible here and there—notably in the leaves in the upper right-hand corner (Plate 127)—was applied with a Koh-i-noor (Hardtmuth) Negro pencil. The Dixon Best Black No. 331 is another excellent pencil for this sort of thing; doubtless there are many others. Such lines define form and add texture. They practically disappear as the coloring progresses, so require no particular care.

FOUNDATION WASH Now a pale mixture of Naples yellow and chrome orange was applied to the entire paper with a large brush. This fixed the lines somewhat and prepared the surface for subsequent washes, at the same time tending to insure chromatic unity.

THE RENDERING PROCEEDS The sky was next washed on with Antwerp blue. This was carried around the trees in this case, though many times such a wash is flowed across them. The lower portion of the sky was tinted with very pale aureolin yellow. (For sky suggestions, read Chapters XXIII and XXIV, Part I.)

While this was drying, a green mixed from gamboge (remember it is fugitive!) and Antwerp blue was applied to the shutters and front door; the same wash, variously modified, served for the lawns, bushes, and the foliage of the large tree. The roofs and chimneys were next tinted with burnt sienna. This same pigment, plus a bit of chrome orange, was selected for the remaining brickwork, the sidewalks, stone wall, and, yellowed a bit more, for the skeleton of the large tree. The reddish flowers beneath this tree, and the distant foliage behind it, were done with chrome orange. The tree masses at the extreme left were tinted with Naples yellow. A bluish-gray tone was given to the shadows of the house and the blue flowers; the windows received a dash of Antwerp blue. The latter blue, plus a touch of alizarin crimson, served for the bush in shadow behind the porch.

It is important thus to kill the white of the paper as soon as possible, and to get some distribution of hue. One never knows when it

may prove necessary for some unexpected reason to call a rendering finished.

Plate 128 shows the entire rendering pushed considerably further. The walls have now been given a slight gradation of tone towards the ground and left-hand end. The brickwork and roof exhibit refinements such as were discussed in Chapter I. Reflected light has been added beneath the cornice. The purplish tones of the tree, stone wall, and sidewalk were formed of cerulean blue and rose madder: burnt sienna was mainly responsible for the brownish-red hues in the larger bushes.

PERIOD OF DISCOURAGEMENT When a rendering is about half finished the beginner often becomes discouraged. It has lost its first freshness yet has not "arrived." This is a good time for him to turn to something else, resting his eye. Or he can study it from across the room or through the diminishing glass or reflected in the mirror. Usually faults will be revealed, or additions suggested. Certain areas will seem too persistent and others timid. The author's rendering was examined in just this way not only once but several times.

FINAL STAGE Plate 129 shows it as completed. It is unnecessary to explain the many small adjustments which have been made. On the house considerable ruling pen work was done. The right foreground trees and bushes, together with the foreground wall and walk, were darkened to make the house seem relatively brighter. The branch hanging between the chimneys proved disturbing and so was scrubbed out.

It is a great art to know when to stop work. Try not to over-render. Many subjects are spoiled because carried too far.

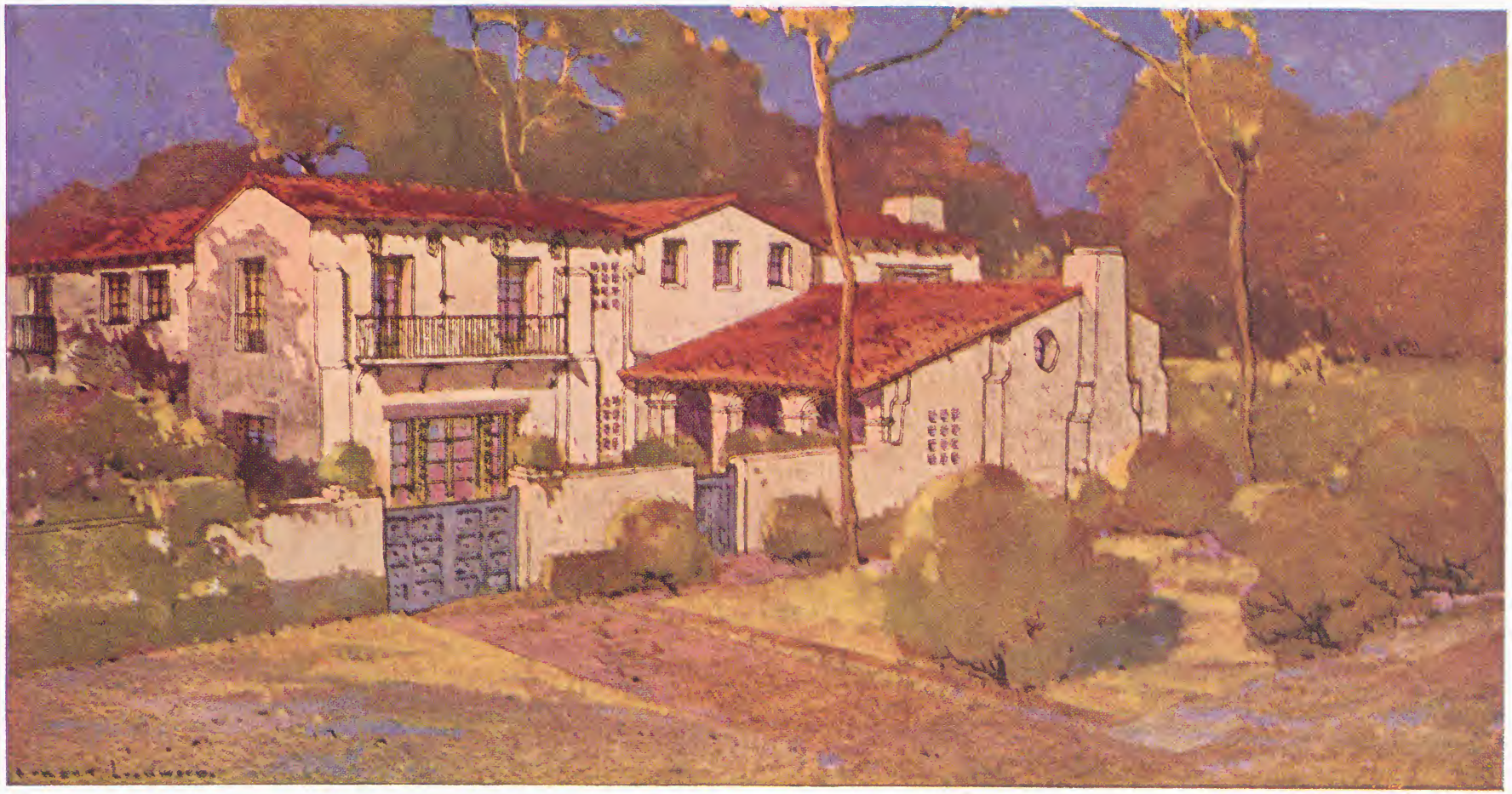
ADDITIONAL SCHEMES To give the reader an idea of the innumerable schemes which are possible, even for a single rendering or subject, Plate 130 was prepared. The house is the same as in the previous example, though brick was substituted in the winter scene. Yet how different these effects are! Sometimes a small sketch similar to one of these can prove as valuable as a more carefully finished study: more often it serves merely as a preliminary for a final rendering.

A COMPARATIVE EXAMPLE It should prove extremely helpful to compare the author's rendering, Plate 129, with the unusually vigorous and colorful example by J. Floyd Yewell, Plates 131 and 132, for though both have certain points in common, in effect they are totally different. They demonstrate the fact that the character of a subject and its setting can often dictate the treatment which is appropriate. Here, both houses are Colonial in style, but the first has a finish and formality which suggest the advisability of a more painstakingly detailed delineation than does Mr. Baum's design. Even the values of their building materials call for different rendering schemes. We have already seen that when a building is light it is common to surround it with dark, while if dark it is encircled with light: the latter method has, in general, been adopted here. Considered broadly, Yewell has rendered the house as a dark, rather dull spot enclosed within a sort of broken ring of light sky, orange trees, and yellow-green lawn, this ring being in turn partly surrounded by the dark foreground shadow and the shrubbery both at left and right, the green trees at the left, and the tops of the pair of large elms above. Thus light is everywhere brought against dark, yet in a well-balanced manner, the whole developing a remarkably bright, sunny attractiveness.

Here are hints on Yewell's method. First, as a means of determining the general composition, several careful studies were made in charcoal. These were followed by others in pastel, a number of color schemes being developed for comparison. The rendering of the final sheet was not started until the artist knew exactly what he wanted to do in every part. This accounts for much of the freshness of color and crispness of handling. The sky was mingled (in yellow, cobalt blue, and rose madder) down to the orange background trees, the large trees being painted against it. The orange trees were mainly of cadmium orange over a foundation of aureolin yellow: their brilliancy is intensified by the many crisp touches of shadow, the little lights also adding interest. The greens were mixed, for the most part, from aureolin yellow and Antwerp blue, darkened here and there by sepia, French blue, or rose madder. Even the dark building is full of color, mostly warm: see Plate 132, showing a portion at full scale. This plate also makes clear what a wet and direct method was used, the colors being applied pure right from the box, and allowed to blend. The window shadows were mainly of burnt sienna; those on the house (which play an important part in the effect of the whole) were of French blue and burnt sienna. The chimneys were

PORTION OF A RENDERING BY ROBERT LOCKWOOD, REPRODUCED AT THREE-FIFTHS ORIGINAL SIZE

The entire rendering from which this was taken measured 60" x 40". It was in colored inks and opaque water colors



TRANSPARENT AND OPAQUE COLOR DRAWING BY ROBERT LOCKWOOD. HOUSE AT BEVERLY HILLS, CAL., BY KOERNER AND GAGE

Here a unique method was employed, combining various materials. Original, 24½" x 13"

done with a single application of burnt sienna, vermilion, and a touch of black. Black was used sparingly on some other parts of the rendering. The butt lines of the shingles were strengthened by means of the brush. Observe the freehand penciling on the tree trunk, Plate 132, and in the foreground foliage, Plate 131.

We have pointed out that the capable renderer is not limited to one medium or manner of working. See, for instance, how different Yewell's painstaking study on page 237 is from this bold, free sketch. Again, Plate 133, from the same hand, shows still another type of treatment, very simple and poster-like. This was done on a sheet of medium tan French water color board. Over a penciled layout the rendering was advanced with opaque colors. Very few hues were used, but they are well distributed: see how the blue of the sky is brought into the shadows on the grass and trees, and how the yellow-green has been carried into the sky. A bit of ruling pen lining can be detected in the building. The method is so obvious it needs no further comment.

In order to demonstrate still further the versatility which the renderer should strive to develop, and to make clear that no one method is best for every purpose, we suggest that the reader turn to Mr. Yewell's other paintings throughout this volume: see index. This artist-architect is also equally at home in such mediums as pencil, pen and ink, pastel, lithograph, and oil.

Having now followed the development of a typical rendering from start to finish, and having brought into comparison with it different renderings, some of similar subjects, our starting point for the critical analysis of the drawings to come seems secure. Chapter V should be read in connection with this one, as it also relates to the treatment of the house.

CHAPTER V

THE RESIDENCE AND ITS SETTING

A CRITICAL REVIEW OF A NUMBER OF EXAMPLES

We continue our thought from the last chapter by referring to another residence rendering by Yewell, Plate 134. In this, both opaque and transparent colors were combined. The subject was laid out on tan board of French make, this underlying tint being partly responsible for the unified color scheme. Like his previous example, the whole is remarkably simple and direct, being free from those tricks of draftsmanship which are sometimes used to impress the client. As a point of particular interest, observe that the foreground trees are so placed as not to interfere vitally with the architecture: note also the employment in the shadows of orange reflected light: see how a single sediment wash serves for the lawn: note the ruled details: above all, study the excellent composition of the whole. It is well to remember that even in effects which seem as spontaneous as here, Yewell almost invariably prepares preliminary studies.

It is helpful to compare these last examples with Plate 135, by Henry R. Diamond, for in this we have a demonstration of the pointillistic method, making use of many tiny brush marks of opaque poster color. Not only does such a handling produce a pleasing vibration and interesting textures, but if mistakes are made the artist can continue to dab on pigment until they are overcome. This drawing was transferred to white illustration board from tracing paper. The opaque pigments chosen were cadmium yellow (pale), cadmium orange, vermilion, alizarin crimson, permanent blue, cobalt blue, and viridian. Though the lawn, as reproduced, is a bit too intensive in relation to the rest, the effect on the whole is excellent.

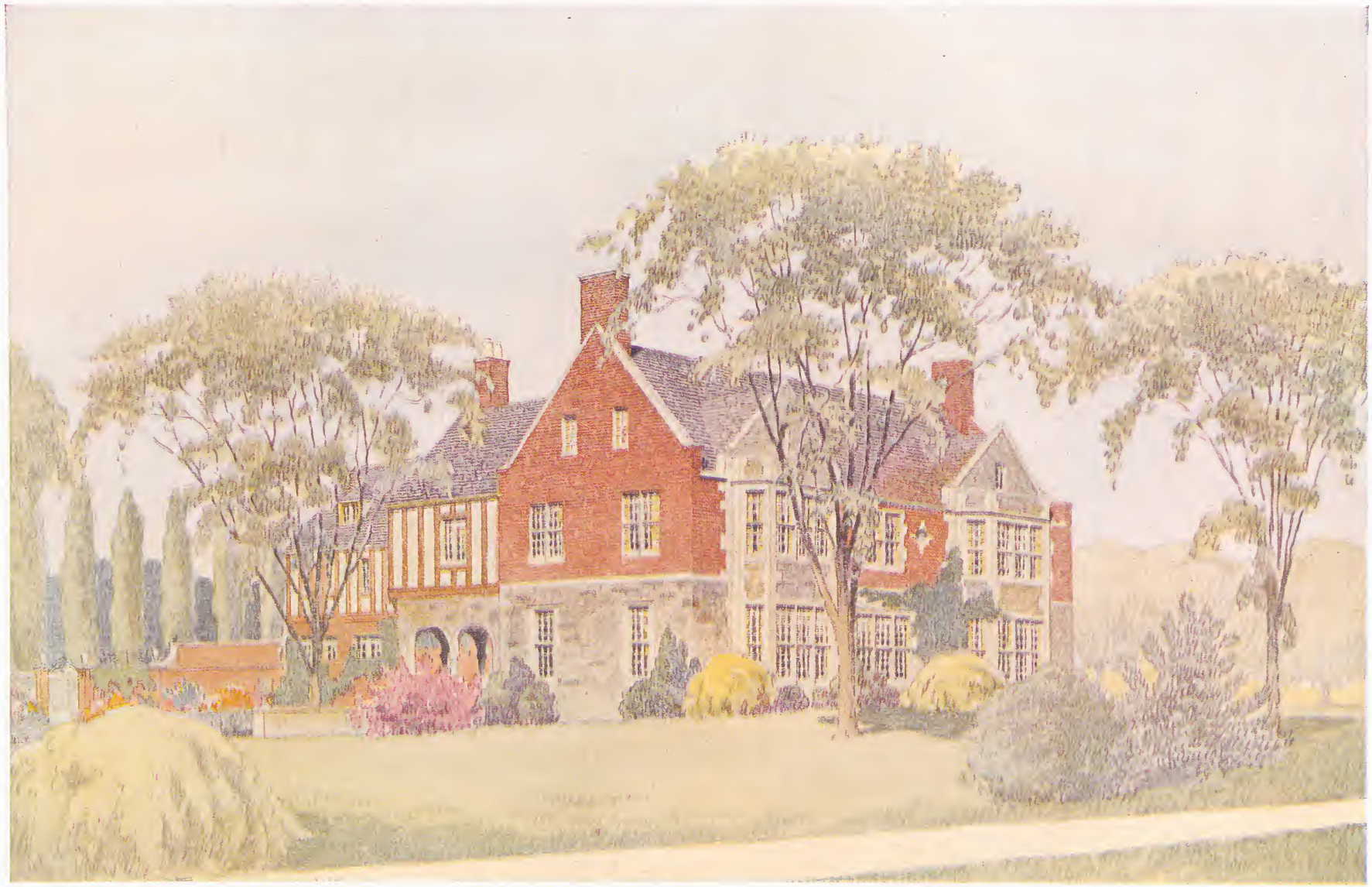
Note that the front of the house, though in sunshine, is pictured considerably darker than the end, correcting a common and mistaken impression that if two like surfaces are in sunshine they must appear the same. A simple experiment with a white cardboard box (preferably rough), held in sunshine and turned to permit the light to hit it at different angles, can help one to understand this matter. Observation of actual buildings will prove other valuable truths regarding appearances. For instance, of two like brick walls in sunshine, the one which receives the light most directly will normally appear the brighter, but if it has deeply raked joints, and is seen in an extremely foreshortened position, the joint shadows may, in combination, darken the effect to a surprising degree. In the same way, it is possible to view a very bright slate roof at such an angle that, because of foreshortening, the butts will almost merge and so greatly darken the tone.

Plate 136, showing but a small portion of a large rendering by Robert Lockwood, reveals an interesting method already fully described on page 225. At the time Mr. Lockwood's other example, Plate 137, was made, he was experimenting with washes, using body color (no transparent color) thinly, like water, laying wash over wash, building up tones. The perspective layout was first outlined in ink, freehand, on brown cardboard. Color was applied to all parts of the drawing at once, establishing a general "key." Then, after working a bit on the foliage, windows, etc., a heavy wash of burnt sienna with a little blue in it was run down over the entire assemblage of body color, which settled it in this case in a rather interesting way. Doing this with thin body color over heavy is a delicate stunt because the heavy color sometimes lifts. It is necessary to use a very full puddle and paint quickly "with extreme care and considerable recklessness" to quote the artist. As a finishing touch, the building, roof, and bits of the foliage were worked up with heavy color. The sky was given a final coat of cobalt, mauve, and black.

A more common and less difficult method is shown as Plate 138. Paul Watkeys was the renderer. Here we have the combination of pencil and water color already studied in

HOUSE FOR THEODORE LEONHARD, DESIGNED AND RENDERED IN PENCIL AND WATER COLOR BY PAUL WATKEYS

In this tinted pencil example the foliage is interestingly composed. Original, 15¼" x 11½"



PENCIL AND WATER COLOR DRAWING BY JOHN C. WENRICH OF A HOUSE BY GORDON AND KAELBER, ARCHITECTS

This rendering is notable for its straightforward representation of building materials. Original, 19½" x 12½"

Chapter XXVII, Part I, and elsewhere. This example was done on gray illustration board in pencil and tinted with transparent water colors, touches of gouache being used for highlights. The subject is ably vignetted. This method not only seems to come quite easily to the draftsman, but, as we see here, is capable of wholly adequate and highly pleasing results. Compare this example with that by the same artist, Plate 106, page 222.

John C. Wenrich was the artist of the tinted pencil drawing, Plate 139. In a subject of this sort one is given a test of his ability to express various building materials, for here we have brick, stone, slate, timber, and plaster in a single structure. The trees and planting are indicated crisply, yet lightly, and are placed to form a natural setting for the building, which, instead of appearing to be supported by the foundation planting, as is too often the case, gives evidence of its contact with terra firma. The distance is nicely suggested. This drawing was made with a B pencil on illustration board and tinted with transparent colors.

No less an expert than Otto Eggers uses this tinted pencil work, as we saw on page 166. Plate 140 shows another example. There are many splendid things about this. The subject is interesting and the surroundings capably composed. The eye is led naturally into the composition by the converging lines of the walk. The dark entranceway shadow forms an accent which helps to focalize the attention. The light central area of walk, walls, steps, and blossoming tree, surrounded as it is by darker tones, aids in the creation of a definite center of interest. The drawing is beautifully vignetted, the whole forming a pleasing spot on the paper, which, in turn, is subdivided into restful well-balanced pattern. The variety in the pencil handling deserves special attention; study in particular the foliage. The open windows give a lived-in look. This drawing was done on tracing paper and mounted, and then rendered in water color, some transparent and some opaque.

Frederick R. Witton's drawing, Plate 141, is another unusually fine and very individual specimen of tinted pencil work—crisp, telling, and with the interest well centered: observe the subordination of the neighboring houses. The tree shadows on buildings and street are extremely well managed, as is the foliage throughout. The light roof and yellow-orange shrubs are a bit unusual.

Distinctive and original is the dramatic rendering by H. L. Coggins, Plate 142. Here a sheet of ordinary white tracing paper was used. The contrasty values were built up completely with graphite pencil, after which color was applied to the back with pastel. The sheet was then stretched (by fastening at the edges) over a piece of tinted illustration board. The original pencil drawing remains with the lines clean and clear, while the color adds to its effectiveness.

Plate 143, by G. L. Scheffler, shows another most interesting study making use of a colored background. The layout was made with a soft pencil directly on a sheet of brown illustration board. The brighter portions of the building were then painted with Chinese white to which sufficient water color was added to give a pleasant warmth. If desired, the warm color can be applied over the white when it has dried. Colored crayon pencils were used for the green and yellow touches on the foreground and trees, while bluish penciling was given prominence in the sky. The foliage and tree trunks were mainly done in black pencil. Note in this light-on-dark treatment how the eye at once focuses on the architecture, and how comparatively small bright areas suggest chromatic richness in the whole.

We have seen, page 231, how Atlee B. Ayres also gains attractive effects in colored crayon on tinted board.

It is but a step from work in colored crayons of the wax or oil type to that in pastel. We have already described this medium so fully (see index) that here we shall merely point to an example, having selected for Plate 144 a drawing by Francis Keally. Here the artist has utilized the pointillistic method, developing an effect of richness and vibration. A bit unusual is the direction of light, which leaves the main walls in shadow. The distant water is well handled. Compare this drawing with another by the same artist, page 72. Study, too, Thomas Ewing King's pastel study, page 173.

While the matter of residence rendering is before us, turn through the pages of Part I, for they offer a number of extremely fine examples in several mediums.

CHAPTER VI

TREATMENTS OF LARGER BUILDINGS

TYPICAL CHURCHES, BANKS, SCHOOLS, AND THE LIKE

It is so easy to turn from residences to such buildings as churches, schools, banks, etc., that little additional instruction seems necessary. For the most part, therefore, our present text will be limited to brief comments on the accompanying illustrations.

CHURCHES As Plate 145 we present a rendering by Alexander E. Hoyle which portrays his subject very faithfully. The drawing was carefully laid out on Whatman paper, after which the coloring was done wholly with transparent pigments. The center of interest shows thoughtful development, the doorway forming a focal point from which the values grade darker above and below. The receding walls and street at the left, as well as the distant trees, have been capably suppressed. Textures, not only in the building but also in the grass and pavement, are nicely indicated. The few figures adjacent to the architecture give scale and increase the life of the subject.

Earl Purdy, in Plate 146, has flanked his subject with tall, somewhat conventional, trees, which, together with the base shrubbery, tree shadows, and panel of lettering, form a dark frame which sets the structure back and adds to its brilliancy. The converging street at the left and the balancing walls and the like at the right have wisely been subdued, as in the previous example, so the architecture develops to the full the commanding power its importance warrants.

Note, as a minor detail, the way in which the tree shadow in the center foreground breaks over the curb, a matter quite fully treated in Chapter XX, Part I. Study also the sky treatment.

The beautifully handled church rendering by Eggers, Plate 147, seems to call for no comment, unless we direct attention to its perfect balance of value and hue, the increase of interest about the center, and the restraint at left and right.

As further examples of successful church representation we point to Plates 148 and 149 by Otho McCrackin. The first, with its free treatment, gives evidence of a rapid hand. It was made in carbon pencil on tracing paper and floated onto a piece of heavy illustration board of warm cream tone. The color was applied in light water color washes, with a few accents of opaque. Observe that, as in all of this artist's work, realistic and decorative characteristics are combined. The drawing is highly individual. The reader will recognize this as the subject so ably handled in black and white by this same artist, page 82.

Plate 149 reproduces a drawing rendered in pencil on Alba tracing paper placed over an accurate perspective layout. The thin paper was afterwards floated onto Upson board (a wall board) and tinted with water color washes, mostly light. A bit of opaque color was added. How effective this simple treatment is, showing it's not what you do but how you do it that really counts!

See the index for reference to additional church treatments.

BANKS Plate 150, by Paul F. Watkeys, offers us a fairly typical handling of a bank. It was drawn in pencil on white illustration board and rendered in transparent water color washes. The sky was both washed and blown. Quite a bit of pencil work was done after the washes were finished. A little Chinese white was employed for highlights. The building being plain in hue, the color at left and right enlivens the whole. The lot was not rectangular, which accounts for what might be taken for perspective distortion. Needless to say, the shadows in a drawing of this sort are of particular importance and must be drawn with reasonable accuracy.

Philip E. Bearse's painting, Plate 151, is more colorful, mainly because of the large trees, but is similar in that it gives careful attention to details. It was drawn in pencil on cold pressed Whatman. The rendering was in transparent water color excepting for the flag and flagpole and like details, which were

RENDERING IN WATER COLOR AND COLORED PENCIL BY OTTO R. EGGERS, WHO WAS ALSO THE ARCHITECT

This scheme has interest well centered and is vignetted with skill. Original, 21¾" x 15"

RENDERING IN PENCIL AND WATER COLOR BY FREDERICK R. WITTON OF A HOUSE BY CHARLES EVERETT, ARCHITECT

The suppression of the neighboring buildings is worthy of note. Original, 25" x 15"

in opaque. The sky and foreground were sprayed with the air brush. For another example by this artist, see Plate 92.

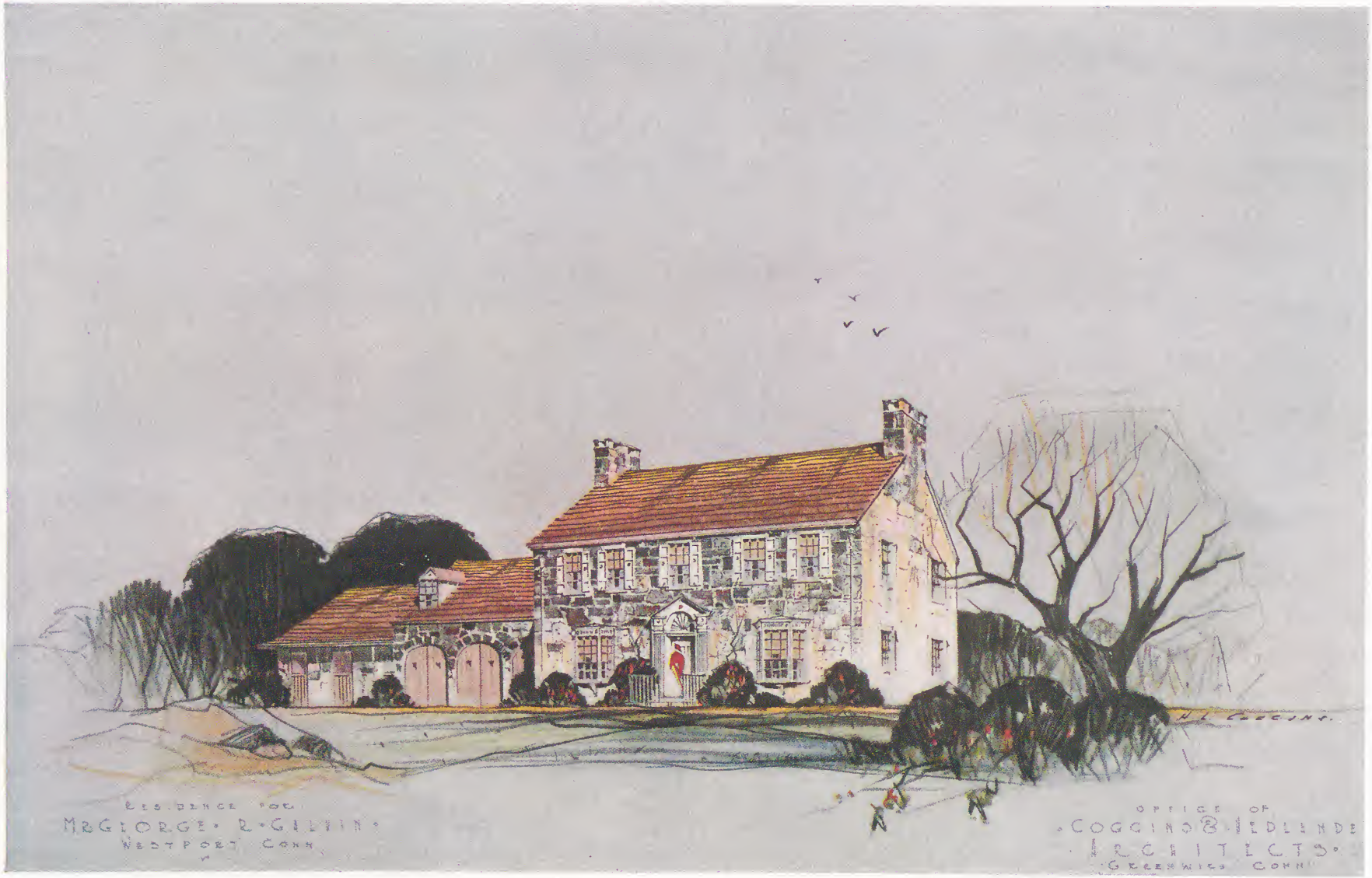
MISCELLANEOUS BUILDINGS Plate 152 offers another of Otho McCrackin's individual studies. His style is particularly practical and pleasing, definite enough to suit the needs of the most exacting client yet possessing vigor and freedom. One feels that this artist enjoys making every drawing he tackles. This example was done on Alba tracing paper with a very soft pencil and fixed, after which it was mounted on wall board and rendered very lightly with sign-painters' pigments. The figures are well expressed (note the absence of features); observe the way in which they and the other accessories are grouped. The trees are worthy of careful study: they are interesting, give the structure its needed relief, and are well related to the composition as a whole.

Successful combination of media is exemplified by O. R. Freeman's rendering, Plate 153, where the effect depends on black and colored pencils used on what appears to have been a tinted paper. When black is thus combined with color in pencil form, the slightly waxy black pencils which come with the colored sets are more harmonious than graphite.

Yewell's rendering, Plate 154, has a somewhat infrequent composition, with the building well above the eye. This was done with transparent washes on fairly smooth Whatman board. The sky was blown on with an atomizer, using cobalt blue over a little rose madder and aureolin applied as an undertone. For the brickwork, vermilion, burnt sienna, and French blue were selected; for the foliage, raw sienna, emerald green, Antwerp blue, and vermilion; for the grass, aureolin and Antwerp blue with an undertone of cadmium orange; for the shadows, French blue, grayed with sienna and vermilion.

Plate 155, by the same artist, demonstrates a different medium and method, for this was made on shadecloth mounted on a heavy board. The layout was drawn directly on the cloth in pencil. A transparent wash of Antwerp blue and rose madder was run over the whole, and then the building, trees, sky, and foreground details were done with opaque colors applied mostly with a brush stippling technique. The original transparent wash was allowed to show through between the dabs of opaque color. Attention is called to the wide distribution of the prevailing hues.

Before going on to the next type of subject, we urge the student to turn our pages once more to study additional similar buildings.

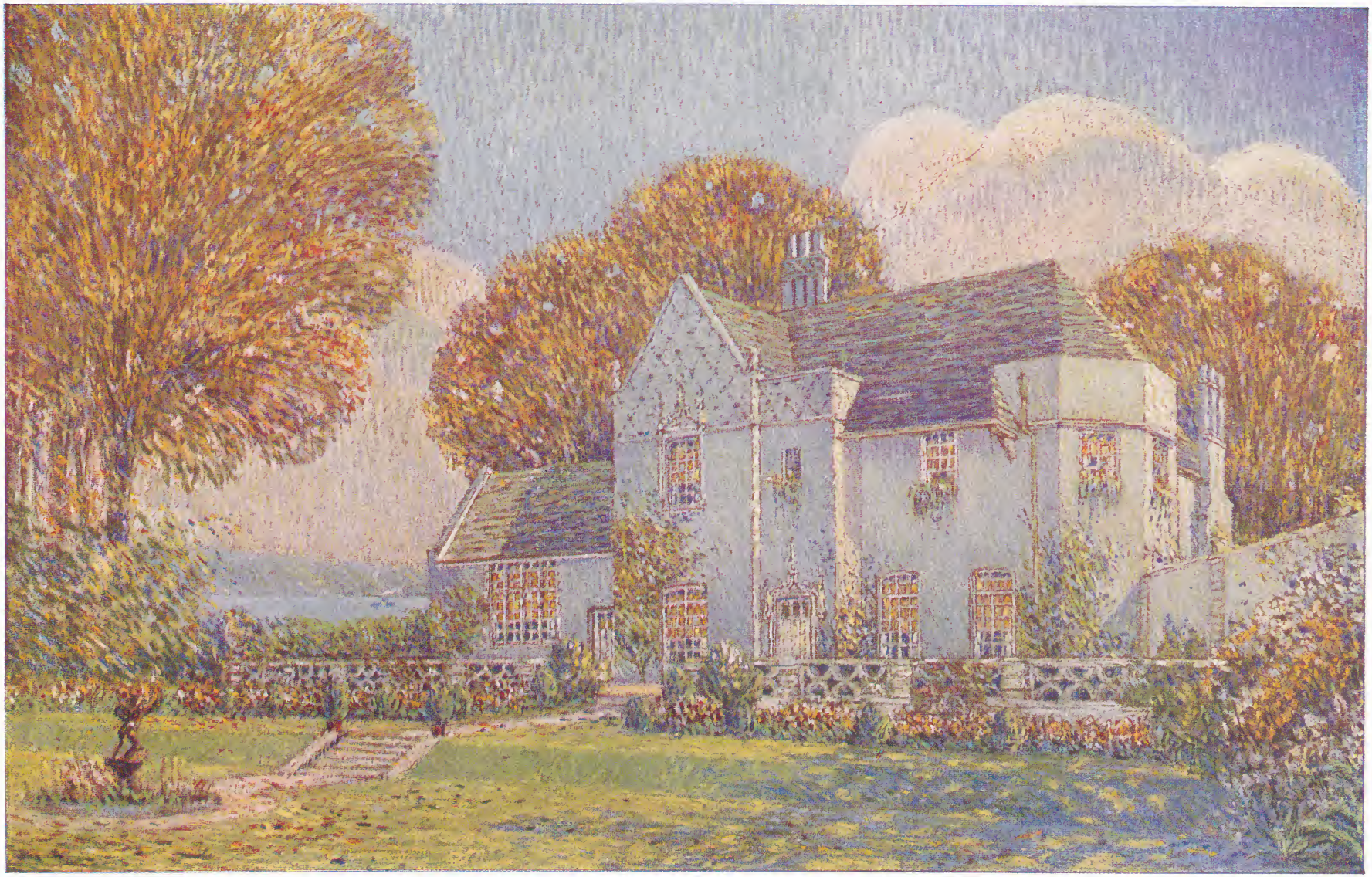


RENDERING IN PENCIL AND PASTEL BY H. L. COGGINS OF COGGINS AND HEDLANDER, ARCHITECTS FOR THE HOUSE

Unique and striking as this treatment is, it presents the architecture with honesty. Original, 16" x 10"

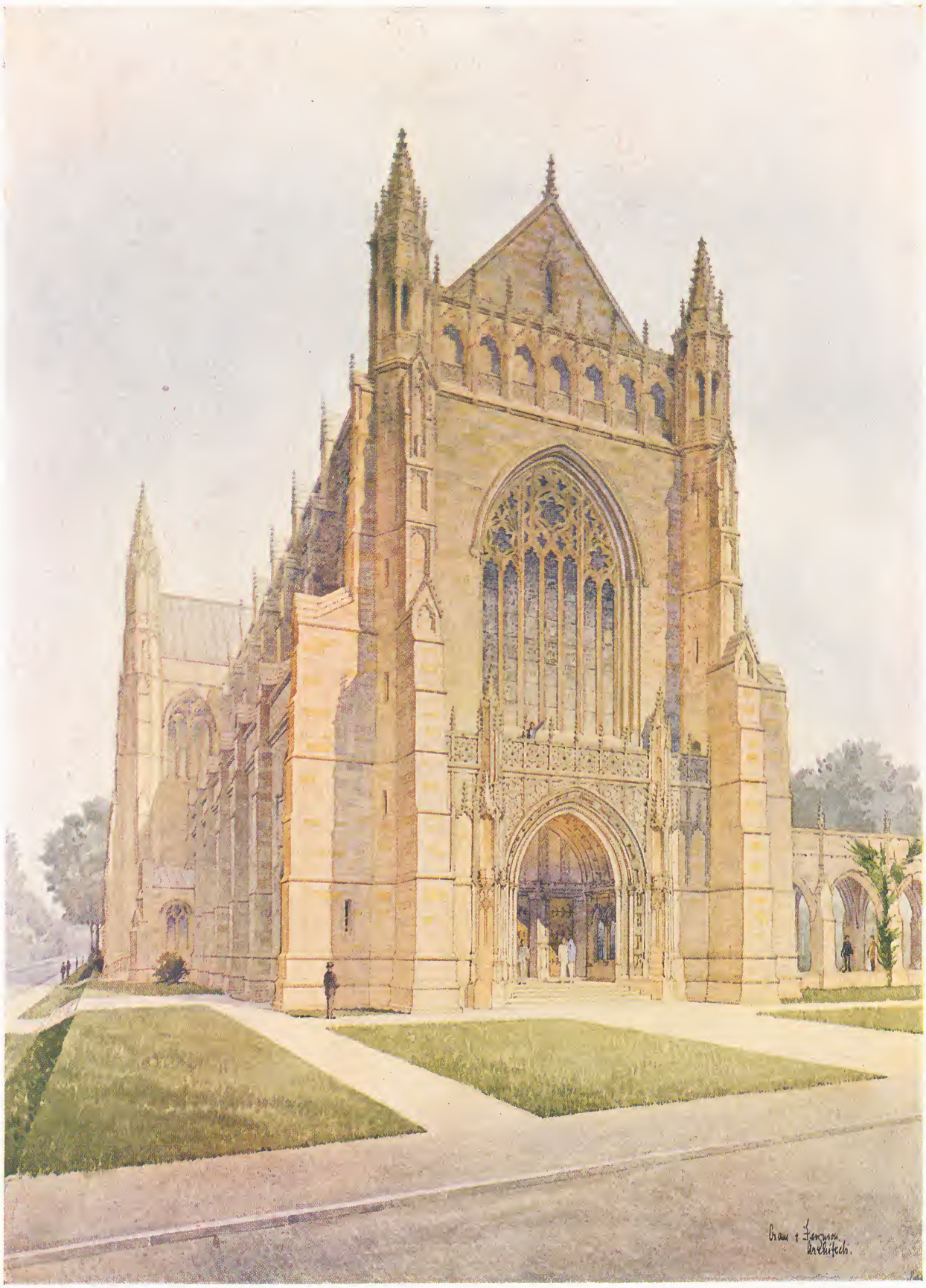
HOUSE BY JOHN C. GREENLEAF, ARCHITECT, RENDERED IN BLACK AND COLORED PENCIL BY G. L. SCHEFFLER

An endless variety of pleasing effects are possible on tinted papers. Original, 29" x 18"



SKETCH BY FRANCIS KEALLY FOR AYMAR EMBURY II, ARCHITECT, TO SHOW AN ALTERATION TO A VICTORIAN HOUSE

Pastel and other forms of colored chalks are becoming increasingly popular in rendering problems. Original, 28" x 18"

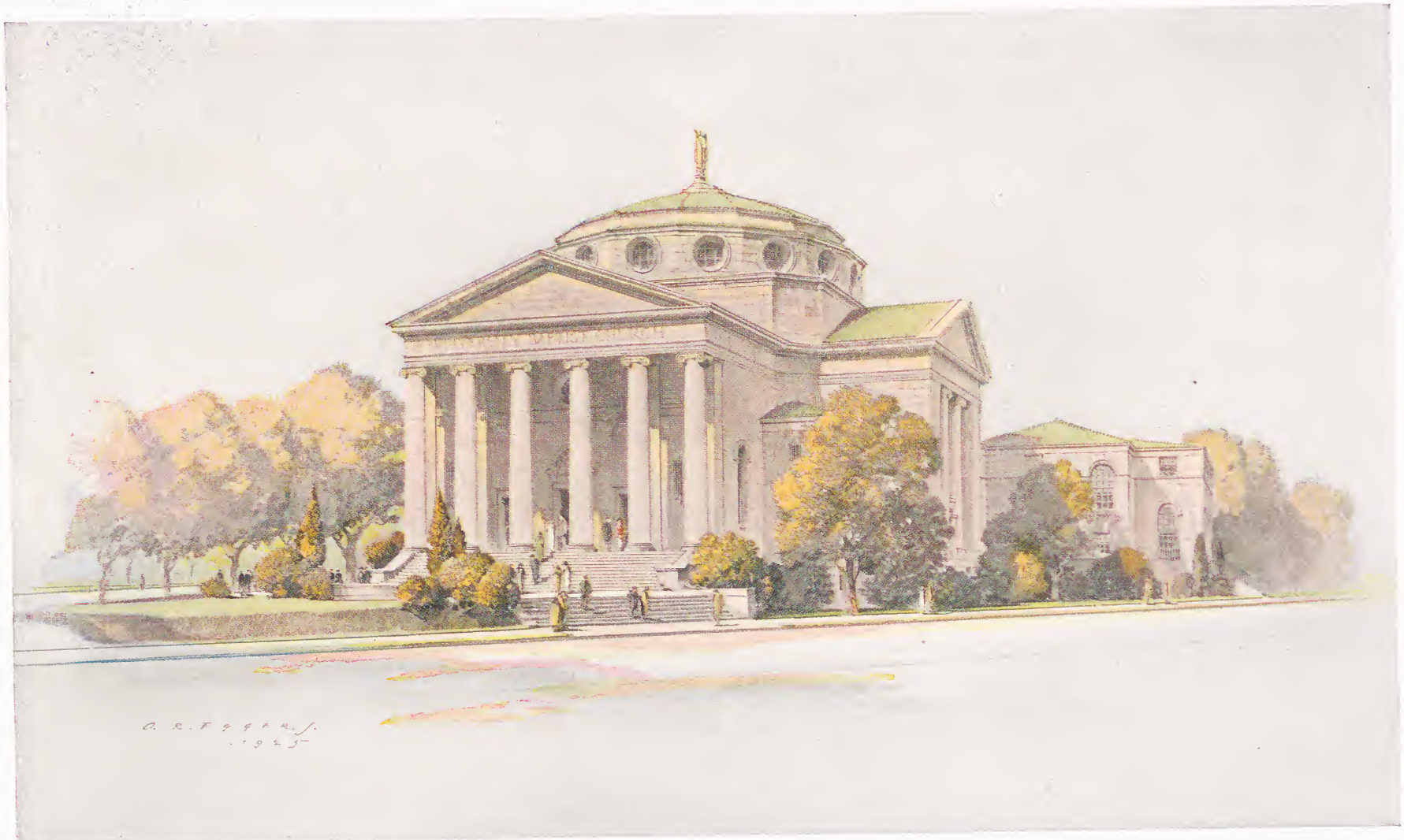


RENDERING BY ALEXANDER E. HOYLE OF CRAM AND FERGUSON'S PRINCETON CHAPEL

Great reduction in size prevents proper expression of the richness of the original. Original, 26½" x 36½"

A WATER COLOR DRAWING BY EARL PURDY OF A CHURCH BY DWIGHT JAMES BAUM

Here the dark trees have been used to enframe the building. Original, 28½" x 19"



RENDERING BY OTTO R. EGGERS OF UNIVERSITY BAPTIST CHURCH, BALTIMORE, MARYLAND. JOHN RUSSELL POPE, ARCHITECT

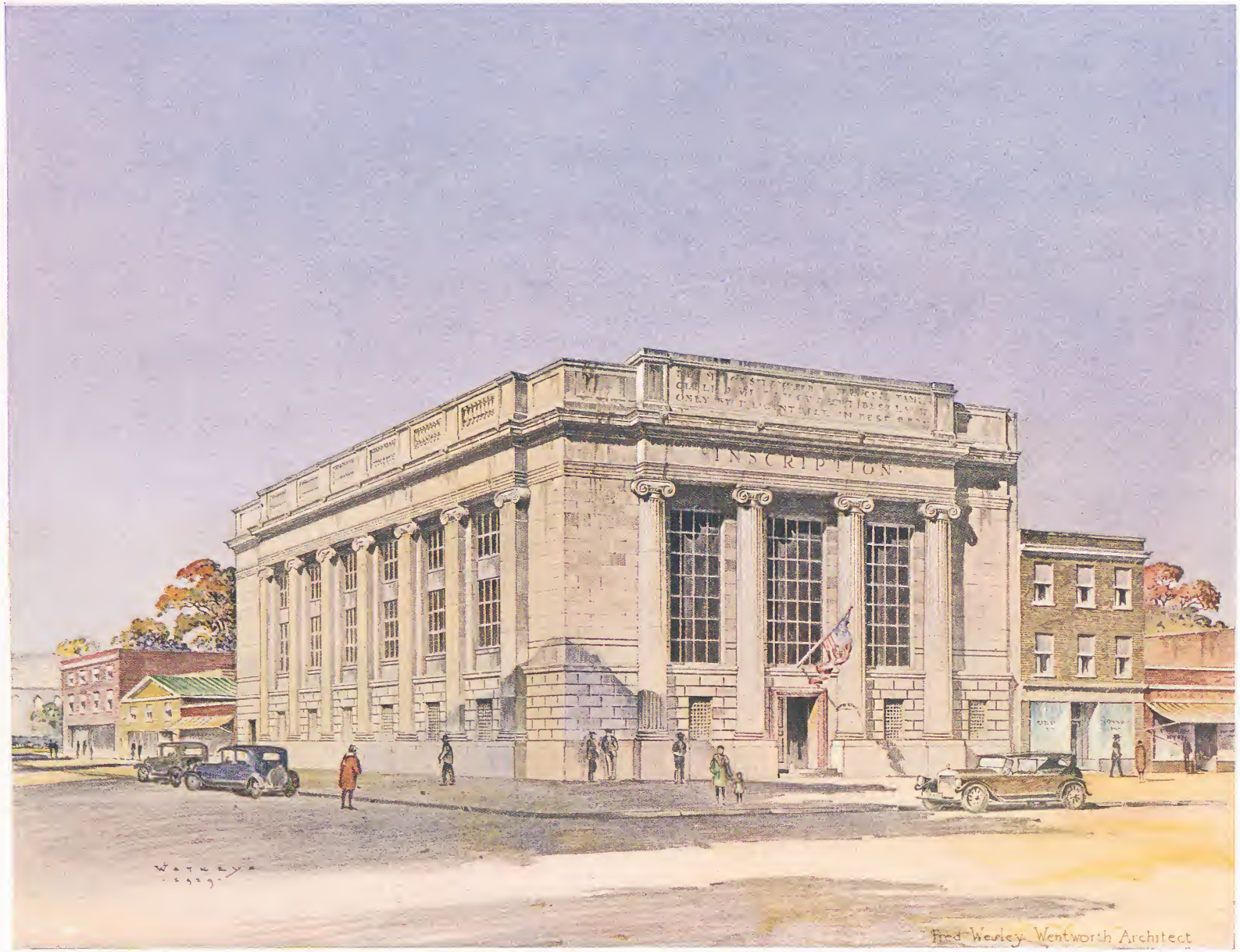
A dignified treatment with an interest extremely well focalized: observe the careful vignetting. Original, 28½" x 17"

RENDERING IN CARBON PENCIL AND WATER COLOR BY OTHO McCRACKIN OF A CHURCH BY MANN AND COMPANY, ARCHITECTS

This highly individual handling was done on floated tracing paper. Original, 23½" x 14"

PENCIL AND WATER COLOR DRAWING BY OTHO McCRACKIN OF A CHURCH BY MANN AND COMPANY, ARCHITECTS

The simplest of color schemes is enough to give this penciled example ample richness of hue. Original, 34" x 16"

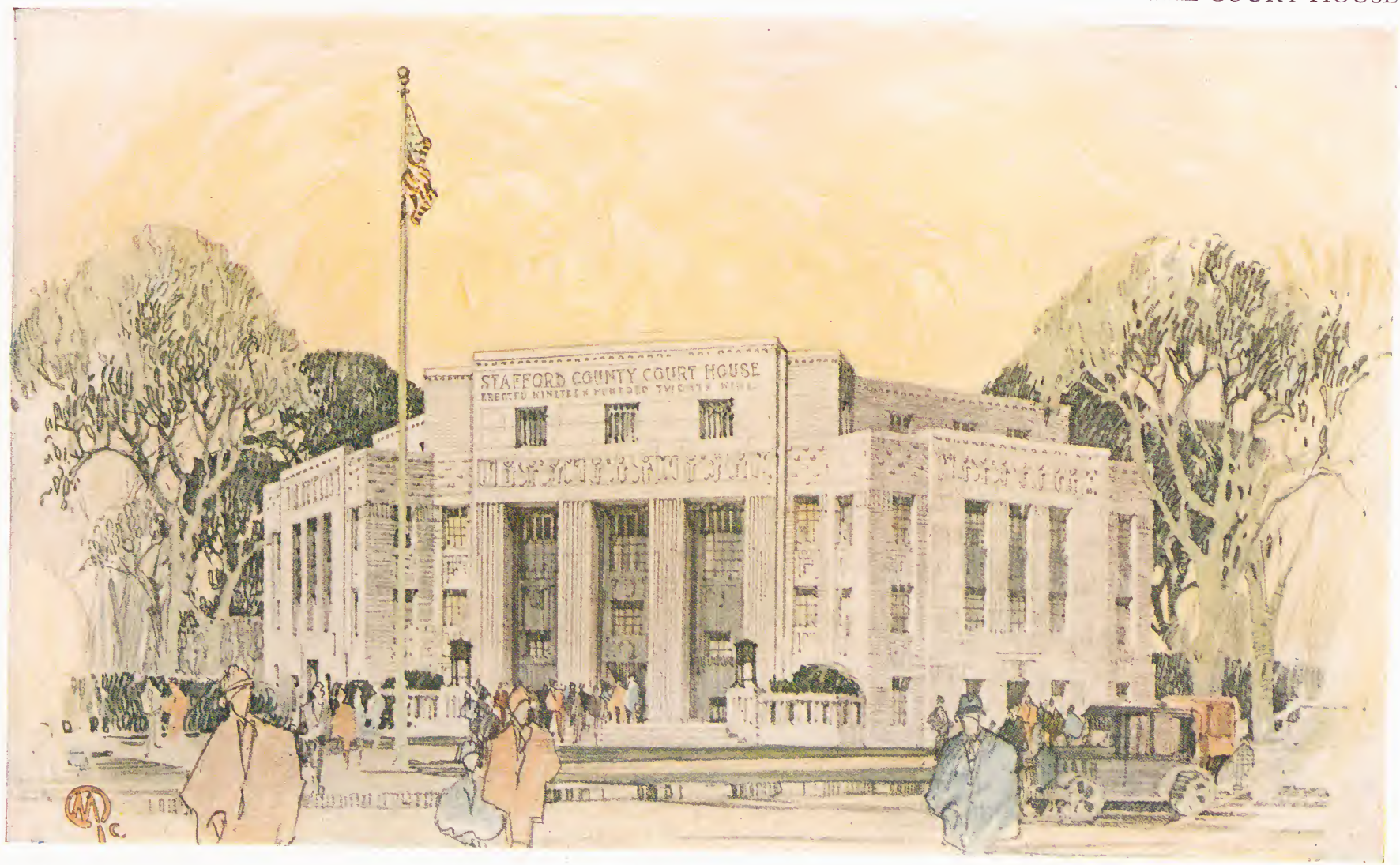


WATER COLOR DRAWING BY PAUL F. WATKEYS. DESIGN FOR A BANK BY FRED W. WENTWORTH, ARCHITECT

Again the pencil plays a leading part in this studied treatment. Original, 25¾" x 20"

SMALL BANK BY HOLMES AND WINSLOW, ARCHITECTS, WATER COLOR BY PHILIP E. BEARSE

The sky and foreground were blown with an air brush. Note reflected light in archway. Original, 22½" x 21¼"



PENCIL AND WATER COLOR RENDERING BY OTHO McCRACKIN. A KANSAS COURT HOUSE, MANN AND COMPANY, ARCHITECTS

Here the figures and accessories are treated consistently with the architecture. Original, 22" x 13½"

BLACK AND COLORED PENCIL DRAWING BY O. RICKER FREEMAN OF A GYMNASIUM BY LOCKWOOD GREENE & COMPANY, INC.

Colored pencils, with or without black, are capable of extremely pleasing results. Original, 41" x 20"

SCHOOL AT COLD SPRING, NEW YORK, BY TOOKER AND MARSH, ARCHITECTS, RENDERED IN WATER COLOR BY J. FLOYD YEWELL

Now and then it proves necessary to picture a structure wholly above the eye. Original, 35¾" x 19¼"

RENDERING BY J. FLOYD YEWELL OF CLARENCE S. STEIN'S DESIGN FOR WICHITA ART INSTITUTE, WICHITA, KANSAS

Rather spectrum-like are the gradations of hue which this unique handling in opaque and transparent water color offers. Original, 61" x 36"

WATER COLOR PAINTING BY LUSBY SIMPSON. PORT OF NEW YORK AUTHORITY BUILDING
ABBOTT, MERKT & CO., ENGINEER-ARCHITECT

Note that the leading colors here are all extremely well distributed. Original, 23¼" x 19"

PENCIL AND WATER COLOR STUDY FOR CHICAGO WAR MEMORIAL BY JOHN WENRICH.
VOORHEES, GMELIN & WALKER, ARCHITECTS

Gradation once more plays a prominent part in this study exemplifying the beauty of restraint in mass and hue

CHAPTER VII

BUILDINGS OF THE SKYSCRAPER CLASS

EMPHASIZING THE UNUSUAL PROBLEMS INVOLVED

Many amateur renderers shun large buildings as difficult to do. Actually they are often easier than other types. The mere fact that they have to be reduced to drawing paper size forces the elimination or simplification of a vast amount of detail. The masses of most large buildings today are simple and block-like, too. And their surroundings are customarily so small in scale as to require little accurate representation.

Not that these buildings don't require patience, for they do. But they are easier in relation to other structures than many believe. Possibly the thing requiring the most skill is the choice of a station point. Too frequently this is taken so close that upper stories are thrown into extremely acute perspective, the effect being unnatural. Small scale preliminaries should be made to determine the best station point, angle of view, height of eye, etc., ample distance being allowed from spectator to subject. The same preliminaries, rendered a bit, can help one to decide on such things as the proper direction of lighting, general composition, and color scheme.

When it comes to the final rendering, care must be taken that it does not grow too complex. Windows should be treated simply, and without much variety—see Plate 156. We have learned that the windows near the top of a tall building, especially if on the shade side, frequently reflect the sky and so can be painted blue, the detail within being invisible. Yet they must not be rendered to look like holes through the building, as they may if they exactly match the sky. Windows nearer the street often reflect buildings opposite, and so appear warmer. Or they lose their reflective quality and permit clear view of whatever is behind them. Window reveals should not be drawn too deep; it is easy to forget their correct scale. Remember that in many modern buildings the glass is scarcely back of the plane of the outside wall.

Windows are by no means the only things which must be treated simply. Brick courses and the like can seldom be put in at proper scale. Instead they are merely indicated. Even ornamental detail is usually treated suggestively.

As the sky is darker and more vivid towards the zenith than nearer the horizon, light buildings are often thrown into relief against it. Unless the architecture is too severe, plain or evenly graded skies are generally the best. If clouds are used they must not detract from the architecture.

MEDIUM Though water color is the most popular medium for this type of subject, there has been a tendency in recent years towards others, particularly oil paints. Though not considered as practical for small detail, they lend themselves rather well to effects dependent mainly on the expression of mass.

EXAMPLES In choosing our illustrations we have included work in several media. We start with a water color by Lusby Simpson, Plate 156. For this, the artist first made a pencil layout which was transferred by double rubbing to Whatman rough water color paper, mounted on stiff board. A preliminary ground wash of ochre and sienna, showing in the light parts of the building and clouds, was put on to tie everything together. Then all parts of the drawing were advanced at once, general tones and masses in sky, planes of building, indication of surroundings, shadows on building, more work on sky, detail on building, detail on surroundings and foreground, scrubbing and finish on sky. Save for pencil indication on muntins and flat relief and lettering at third story, the entire drawing was rendered with transparent water color applied with French quill and camel hair brushes. The work on the building and foreground was quite direct, with no washing or erasing, but considerable scrubbing was done on the sky to keep the airy quality of the rough white paper. We have elsewhere called attention to the use of green in this sky and the manner in which it is re-

PENCIL AND WATER COLOR DRAWING BY O. R. FREEMAN. SEASIDE HOTEL
BY LOCKWOOD GREENE & CO., INC., ARCHITECTS

A rendering with warm hues surrounded by cool focusses attention. Original, 18" x 24¾"

SUGARMAN AND BERGER'S HOTEL NEW YORKER PAINTED IN OILS BY CHESLEY BONESTELL

Night scenes with flood lighting have grown increasingly popular. Original, 38" x 64"

echoed in other parts of the entourage. Note the similar distribution of blue and brown. Observe that the light walls towards the left have dark clouds behind them, while the upper front wall, rather dark, is shown against lighter clouds.

Next we turn to John Wenrich's rendering, Plate 157, in which he shows us what a pleasing effect can be obtained even when there is little detail. For here we have the beauty of simplicity. Though the average subject, with its windows and all, is much more complex than this, the renderer can draw a lesson from this handling, striving always for something this breadth of treatment. Observe how a center of interest has been built up through contrasts of hue and value, the figures playing a part. (These figures, incidentally, instead of being thoughtlessly scattered, are composed to lead the eye where the artist wished.) We have repeatedly emphasized that such arrangements usually come about only after careful tracing paper study. The center of interest has been subtly strengthened through the toning down of the drawing at the edges.

This study was rendered completely on warm gray Fabriano pastel paper with black crayon. The dark values were built up with very thin opaque water color, and the brightly lighted portions were put in with heavy opaque color. The purpose of completing the crayon drawing first was to give texture to the large flat masses which might otherwise have lacked character. The shading followed the grain of the paper, which ran up and down.

We have a somewhat similar marriage of media in O. R. Freeman's rendering, Plate 158, where colored pencil and opaque water color were combined. Observe the striking contrasts of both value and hue. The entire structure becomes the focal point and to this all else is subordinated: note, for example, the boardwalk and beach. The complementary contrast of the warm-toned buildings and cool setting is pleasingly modified by the introduction of some warm areas within the cool and vice versa. Further comment seems unnecessary as the drawing explains itself. The final effect is a logical and appropriate expression of the architecture, and the drawing is of the peppy type which carries well if exhibited and reproduces to advantage.

We discover quite a different medium in turning to the dramatic depiction of architecture, Plates 159 and 160, for in this Chesley Bonestell has worked with oils. We have already described his method in Chapter XXVII, Part I. The representation of night effects has become more and more popular in recent years, due mainly to the increased use of floodlighting and other forms of artificial illumination. See how the effects here, not only of the lighted setbacks, but practically everywhere, depend largely on the employment of graded tones so studied as to create strong contrasts. The balance of light, dark, and color in the entire subject is well handled. As an interesting detail, note the tiny airplane above. The technique is clearly shown on Plate 160.

Somewhat more pastel-like in its general effect, though again employing vigorous contrasts, is Chester B. Price's oil rendering, Plate 161. For his method, see page 228. The simplicity and breadth of treatment here is most commendable: extremely little detail has been developed. The building comes up into the light nicely from the dark semi-gloom of the foreground. See how on the entrance façade the vertical light and dark striping has been softened towards the ground by means of grades. The cloud masses are composed to re-echo the rounded forms from below and to frame the building; at the same time they recall every color, guaranteeing chromatic equilibrium. The figures, foliage and other accessories are managed with rare skill both as to placement and attention value. From whatever standpoint we judge this, it is a splendid production—the sort of thing which doesn't merely happen.

Plates 162 and 163, by Edward Trumbull, give us additional pastel-like uses of oil paints in architectural rendering. In both, the windows and like details have been nicely suppressed, as have the surroundings if we except the activity in the street: even here the treatment is sufficiently suggestive to prevent any serious interference with the focalization of attention on the structures. For the eye goes at once to the vertical planes of the subject matter beyond and is carried up to their crowning features above. The coloring is exceptionally varied, running in lowered intensity (for the most part) the full gamut of the spectrum. These paintings have an expression of atmosphere not often found in architectural renderings: see how in Plate 163 the main building rises from an indefinite tone which detaches it splendidly from the low structures of the foreground.

CHAPTER VIII

NEXT WE COME TO THE ELEVATION

SUGGESTIONS ON APPROPRIATE CONVENTIONALITIES

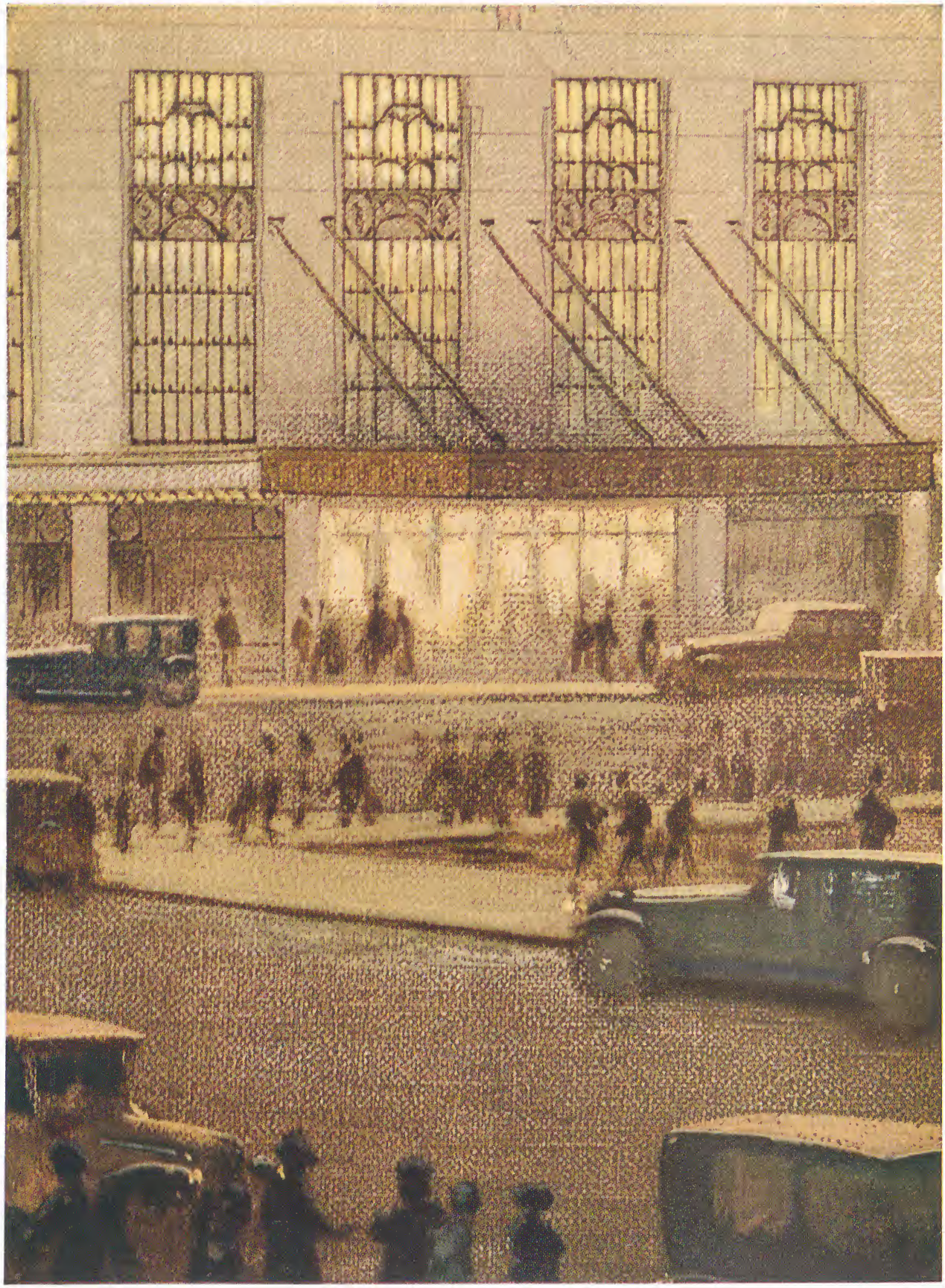
Usually when one thinks of rendered architectural elevations, his mind turns to such formal drawings as are often submitted by architects in competitions for state capitols and other buildings of major importance—such drawings, for instance (though sometimes in color), as that from John Russell Pope's office, which we presented as Plate 3. Generally these are highly conventional; the values are few and simple and the colors, if any, subdued. One thinks, too, of the more pretentious problems done in our architectural schools. As renderings of these types have elsewhere received their full share of attention, not only in the architectural magazines and Beaux Arts Institute of Design bulletins, but in such books as Harbeson's *The Study of Architectural Design* (The Reinhold Publishing Corporation), and Magonigle's *Architectural Rendering in Wash* (Scribner's), we place our emphasis here on a less formal kind of work more closely allied with that which we have already shown.

Plate 164, for instance, though a Beaux Arts project, is not in effect unlike some of the perspective renderings we have recently seen, the main difference being that here the entourage has been more highly conventionalized to bring it into harmony with the T-square and triangle character of the architecture. The trees have been handled as flat or simply graded masses, with profiles suggestive of the straight line. The landscape is more decorative than naturalistic. Mr. Gillette has employed a technical method of interest. His drawing was made on Paragon paper in pencil and then completely rendered in very strong contrasts of water color. Over this, two separate sprays of Chinese white were applied, one mixed with several yellows and the other with emerald green. This gave the architecture a unified tone, yet the various colors showed through. The dark values were so killed, however, that it was necessary to render the building again, the darks being restored by removing the spray with water and a brush. Finally highlights, such as the roof tiles, were added, and the elevation was generally snapped up. When such spraying is done it is possible, of course, to protect any desired portion from the spray: see Chapter XXIV, Part I.

Spray was again used in Alfred T. Granger's rendering, Plate 165, as was the ruling pen brick indication described in Chapter I, Part II. The rest of the work, excepting the pen-ruled highlights on the window sashes, etc. (these were in Albanine white), was done with transparent water colors brushed on. All these processes show clearly, as the reproduction is at the original size. The sky was blown in with blue over a preliminary wash of burnt sienna and yellow ochre: some color was also blown on the foreground. The pencil construction in this case was done on illustration board, the shadows being cast in the conventional 45° manner.

Unfortunately it has been necessary to reduce E. Warren Hoak's painstaking rendering, Plate 166, to such an extent that the finer detail is largely lost. The problem in rendering this subject was to reproduce the painted portions of the façade faithfully and at the same time not to be carried away by them to the sacrifice of the architectural design and sculptured ornament. Consequently the shadows were underpainted with washes of India ink and then color was applied as a stain, built up to value, and sponged. Accents of fresh color were finally added to bring the architecture forward.

We next turn to a striking treatment by Cecil C. Briggs, Plates 167 and 168. In the first, we observe that the entire composition is unusually decorative. The curved lines of the clouds and sails help to frame the architecture. The color is well distributed; the lettering effective. Plate 168 shows the character of the dilute ink layout and reveals the texture of the sediment washes. Among the well handled details are the wall of rubble and the figures. We



DETAIL REPRODUCED AT FULL SIZE FROM OIL PAINTING BY CHESLEY BONESTELL, PLATE 159

This shows clearly the canvas texture and the amount of detail employed

CHESTER B. PRICE'S PAINTING OF VOORHEES, GMELIN & WALKER'S WEST'N UNION B'LD'G

The large masses treated with breadth: the color rich and well distributed. Original, 25½" x 36½"

have elsewhere mentioned that this same building was the subject of Edgar I. Williams' sketch, page 108. It is highly instructive to compare the two.

It is also helpful to compare this drawing in transparent color with H. Raymond Bishop's opaque study of the Bok tower, Plates 169 and 170. The latter subject shows, in place of the vigor of the former, a soft, delicate effect, very pleasing in hue. No small part of its beauty depends on the gradation from the dull, cool, lower portions to the relatively brilliant, warmer features above. As we have pointed out, this bringing of a dark or dull mass up into light is a very effective treatment for tall structures; this is especially true when, as here, the richness of the architecture is concentrated at or near the top. This beautiful rendering was made on white water color paper mounted on wall board. An underlying transparent wash of Antwerp blue and rose madder was laid over the whole, after which the rendering was built up with opaque color applied with the brush in stipple technique. Plate 170 shows the method clearly. Note the vibrant, harmonious effect. The stone at this point was Georgia Pink marble, and the colored window tracery of glazed Enfield tile.

We present, as Plate 171, another vertical structure a bit similar in setting, though quite different in design. This is by the well-known architect, H. Van Buren Magonigle, whose book *Architectural Rendering in Wash* we have so unreservedly recommended. Strictly speaking, this drawing is not in elevation, but we can easily overlook this fact. We have already mentioned the color scheme (page 67), which is extremely simple in general effect. When we spoke, at the beginning of this chapter, of the use of subdued tones in formal rendering, we had in mind just such dignified treatments as this. It is evident that clouds or trees could easily be handled so conspicuously as to detract from architecture of this nature and scale; the student is quite likely to fail to observe the proper restraint when rendering such subjects.

We next exhibit a pair of reproductions of parts of elevation drawings by Francis S. Swales, Plates 172 and 173. Each shows a portion of one of eight large drawings by this architect: there is some reduction in size. The drawings were inked with brown or dilute black ink and then rendered with water color. In general the palette used consisted of light red, aureolin yellow, viridian, and four blues —cerulean, cobalt, ultramarine, and smalt. One of the main lessons which we can learn from these studies is the manner in which distance can be suggested in elevations by means of different hues and values for surfaces at various distances from the spectator. It is not difficult, even in Plate 172, to know which planes are near at hand, while in Plate 173 there is an exceptionally striking illustration of the gradual change from warm areas to cool as planes become successively more distant. Thus, though the drawing is in elevation, a marked feeling of aerial perspective is developed.

We conclude this gallery of elevations with one demonstrating a wholly different type of subject and treatment, Schell Lewis' drawing, Plate 174, giving us the realistic sort of effect that we customarily associate with perspective presentations. Yet it is only in the entourage that perspective has been employed. Many buildings, however, cannot be adequately expressed in elevation. There is little to say about this drawing that we have not already said about others of the tinted pencil type. It was completely rendered in pencil on tracing paper, over an accurate layout, and then floated onto a mount, after which washes of transparent water color were applied. Its excellence is self-evident.

CHAPTER IX

SKETCHING, RENDERING INTERIORS

SOME "WHYS" AND "HOWS" CONCERNING THIS WORK

Just as outdoor sketching is the best preparation for rendering exteriors, so indoor sketching gives one the soundest training for serious interior delineation. Such still life painting as was discussed in Chapter XVII, Part I, offers a splendid starting point; as we mentioned there this could advantageously be followed by the painting of room corners, furniture groupings, and the like, with special attention to such fabrics as are common to draperies and upholstery.

Appearances indoors and out are to a surprising extent dissimilar. Not only does one find different materials indoors, but a changed quantity and quality of illumination. Most outdoor light comes direct from a single illuminant—the sun—and results not only in far brighter effects than are common to interiors, but in clean-cut shadows of systematic formation and sharp contrasts generally. Interior appearances (barring those due to artificial illumination) depend almost wholly on indirect or diffused light, which, instead of coming from one direction in the form of parallel rays, often radiates from several sources such as doors and windows. These sources not only provide less brilliant illumination, but, being comparatively low in position, introduce it on a level with, or below, many of the objects. The shadows formed by this radiating light not only vary individually in direction, value, and quality of edge, but, since the light comes from several sources, they often multiply or overlap in complex ways. Even when sunlight pours into a room, it provides clean-cut value contrasts only in limited areas, the rest of the room (which seems all the more gloomy in comparison with this bright light) receiving its illumination indirectly from these sunlit spots (or from bright things outdoors) as reflected in every direction. The artist of interiors, therefore, looks for less brilliant lighting and coloring than we find outdoors, and for greater variation in strength, character, and direction of light. He expects multiplicity of shadow—a lighting fixture may cast several shadows on the ceiling—and great diversity of edge. Because of the preponderance of reflected light indoors, light and color are thrown from surface to surface in a truly amazing manner. All this complexity is sometimes to the advantage of the artist, who can paint much as he pleases and still have things look right, yet more often it proves confusing. And in another way he has a handicap not found outdoors—he can't stick in bushes, clouds, and like accessories. His location of point of view is more restricted, too: he can't, as a rule, look up or down at his subject or push it into the distance. So, on the whole, it is hard to say which is easier to do, the exterior or the interior. It is certainly true that in the architectural profession there are comparatively few men who render interiors as well as they do exteriors. The main thing for the beginner is to realize from the start that the two are different, and to understand what the main differences are.

An ideal approach to interior rendering, once a bit of still life work and a few interior details have been attempted, is to make honest studies of existing rooms. In the first of these one should seek to record the larger impressions as Vernon Howe Bailey has so successfully done in his paintings reproduced as Plates 175, 176, and 177. Later, if he desires, he can give greater attention to careful finish.

When Mr. Bailey is about to sketch a subject, his first consideration is its placement within the paper area. He prefers to locate the chief element off center (to avoid a stiff, symmetrical arrangement). Thus in the English room, Plate 175, he placed the mantel slightly to the right. Having decided on the angle point of view, he quickly establishes his composition on his paper by light, freely indicated pencil lines, with no attempt to locate more than the leading masses. This usually takes him fifteen or twenty minutes. With both color box and sketch block held in the

FULLER BUILDING, NEW YORK, PAINTED BY EDWARD TRUMBULL

Several pastel preliminaries were made for the architects, Walker and Gillette. Original, 42″ x 60″

OIL PAINTING BY EDWARD TRUMBULL FOR McKENZIE, VOORHEES & GMELIN

The New York Telephone Building rising majestically from a satisfying foreground. Original, 42" x 72"

left hand, he proceeds to paint. Generally he lays in the yellows (with ochre a favorite) first, proceeding to darker tones. He likes Fabriano medium surface heavyweight paper, but gives it no preliminary wetting. Instead, he charges his brushes fully, and applies them with directness and breadth, often completing the entire subject with a brush of one size. He finishes each drawing in a sitting, finding it quite impossible to regain the same mood following an intermission in his work.

The room shown on Plate 175 had a grandeur and dignity which Mr. Bailey has caught with particular success. Note the rich tones of the dark woodwork and the clever indication of paneling and carving; observe the splendidly managed draped window, the portrait, the mirror, and other details. All are convincing: this is no imaginary room.

Wholly different in color scheme is his second sketch, Plate 176: even the personality of the room is different. Note that in going after the big essentials Mr. Bailey hasn't worried over little matters which so often concern the beginner. He has merely sought an impression, first building a center of interest about the fireplace and then rounding out the whole. Every detail is so well managed that words seem superfluous. No one but a master could suggest all his materials and textures so faithfully with such economical means, and at the same time arrange his contrasts so tellingly. Even his freehand perspective layout evidences rare skill.

Plate 177 shows the same skilful handling. Again the details are merely indicated, attention being concentrated on catching the spirit of the place. See how the complicated chandelier, the detailed carving of the furniture, and the foreshortened squares of the floor are suggested—a maximum of truth arrived at with a minimum of effort. One might easily spend the entire time at his disposal laboring over any one of these things. The lighting in all these rooms is good, and they contain real air.

Though the painting by J. Olaf Olson, Plate 178, is not wholly an interior treatment, we include it in this chapter because the handling of its decorated walls and vaulted ceiling should be of particular interest to the interior renderer. We have already listed Mr. Olson's palette and described his method in Chapter XIX, Part I. In this example, note the richness of color and its good distribution; see how the hues of the wall and ceiling have been reechoed in the floor, columns, etc. Observe also the capable way in which the values have been managed so the whole thing hangs together yet affords the desired contrasts.

Ogden W. Kugler has given us, in Plate 179, a treatment which is different from the previous ones, both in medium and approach. Here a tinted paper was used, the rendering being in transparent color and Chinese white. The paper was allowed to show through in places, notably in the planked floor. These materials, applied in an honest, straightforward manner, have produced a result which is not only highly descriptive of the place but rich and pleasing as well.

INTERIOR RENDERING When the student has made a number of sketches such as we have suggested—first of limited areas like room corners, and later of full subjects like those we have just studied—he should be qualified to attempt renderings of proposed interiors. Our present discussion will deal with renderings in perspective, as they naturally come next in line. First, let us examine a few of sketchy type.

Plate 180, by Ernest Born, is a splendid example, having much the dash of Bailey's paintings. Free as it is, it has truth; doubtless it conveys as honest an impression of the proposed interior as would a more labored presentation. The original was drawn on medium Whatman and rendered with a combination of transparent and opaque pigments. The proposed room was to have a hardwood floor, textured plaster walls, and a concrete ceiling decorated with oil paint. As the ceiling was an important feature, it was quite properly given greater emphasis than is ordinarily desirable. See how it brightens towards the windows: note, too, the upward sloping beam shadows, cast by reflected light. Such downward sloping rays from windows as are shown here are sometimes scrubbed or erased; again a bit of opaque paint is employed.

Plate 181 is again by Mr. Born. Here, in place of brilliancy there is subdued richness, the scheme being mainly monochromatic. The plan was to execute the walls in walnut veneer, and the masks in red lacquer. The grilles were to be of composition simulating walnut, and the ceiling of plaster. These materials are capably suggested. The subject was drawn with a brush and India ink on rough water color paper and rendered in sepia, toned here

and there with charcoal. In the curtain, opaque and transparent water colors were combined. The vermilion masks were of opaque. Note the clever indication of details, such as the seats. The well suggested figures give life, scale, and depth.

Carroll Bill's very practical rendering, Plate 182, is somewhat less sketchy. Over a complete pencil layout, still visible, transparent color was tinted on, a little opaque paint being used in the final touches. The floor illustrates some of the points made in Chapter XXV, Part I. Though the reflections are mainly vertical, the horizontal plane is not destroyed.

Plate 183, by O. R. Freeman, is somewhat similar in handling. It was drawn in reverse in pencil on tracing paper and rubbed onto Strathmore water color board. It was rendered with transparent water color, with opaque color employed where highlight or solid color effects were desired. The excellence of the work speaks for itself.

Stanley W. E. Green's efficiently managed rendering, Plate 184, is typical of those made by the better class of interior decorators. It was done in transparent water colors over a careful pencil layout on cold-pressed mounted Whatman. Despite the complexity of detail, especially in the fabrics, the whole has been kept fresh and crisp. This type of work, with its accuracy and completeness, appeals strongly to the client.

Though belonging in our next chapter, strictly speaking, we show Frederic Hirons' elevation study, Plate 185, at this time in order to contrast its free, suggestive treatment (which might eventually be interpreted in a number of ways) with the more final, set handlings of the last few examples. Its qualities of excellence are so evident that words seem superfluous. An interesting contrast is offered between the figures of the decoration and the actual people below. The centralization of attention brought about by stressing the warm-framed middle panel should be noted, as well as the way in which this warmth has been led into the surrounding cooler tones. The neutral base gives just the desired foundation. See how effectively the opaque highlights count throughout.

The rendering from Howard Greenley's office, Plate 186, was done entirely in opaque color. Observe it is complete and meticulous in handling. Study it inch by inch: see especially the floor and base. The rather decorative way in which the brush marks are arranged throughout is not only pleasing and expressive in the texture and pattern created, but it serves to distribute and tie the colors nicely.

E. Donald Robb's exceptionally commendable example, Plate 187, is in oil, and has all the characteristics of a painting from a real place. It was done on oil sketch board of fine texture and after completion was heavily varnished, such treatment seeming to help the effect. Needless to say, only a skilled artist thoroughly familiar with his architecture could create such a thing. The subject is an ambulatory in an imaginary French cathedral. It shows part of the stonework decorated in color in the manner which the mediaeval builders usually intended but only occasionally carried out. How fine both conception and execution are!

CLASS B PROJET, A TOLL HOUSE ON A BRIDGE HEAD, DESIGNED AND RENDERED BY WILLIAM N. GILLETTE

This water color drawing was softened by sprays of opaque white. Original, 36¾" x 17¾"

DETAIL OF RENDERING BY ALFRED T. GRANGER OF A SCHOOL BY WELLS AND HUDSON

The blown sky and ruling pen brickwork are features of interest. Original, this exact size

CHAPTER X

HANDLING THE INTERIOR ELEVATION

A GROUP OF INDIVIDUAL STUDIES, WITH COMMENTS

We must not neglect the treatment of the interior elevation, for it is probable that far more renderings are done in elevation than in perspective. Once one has mastered perspective work, however, elevations should cause little trouble. The main difference is that the latter make greater use of conventionalities, the coloring thus being brought into harmony with the vertical and horizontal T-square and triangle line work.

We can illustrate this by pointing to Plate 188, which shows a typical rendered elevation. This was done in water color by A. B. Le Boutillier. Observe that the entire effect was obtained by the simplest of means. The background is merely a slightly graded wash or two over the still visible penciling. The highlights on the paneling were apparently scrubbed or erased. The books were indicated with the greatest economy of means—note the highlights left on their edges, and the strong darks behind them. The lighting fixtures are equally simple: the vases and tilework demanded a bit more attention. The overmantel portrait is a very fine bit of painting, quite fully worked out. Note how some of the colors in this portrait and frame are recalled in the books, tiles, etc. Its dark tones are balanced by the deep shadow in the fireplace.

Plate 189, by Edgar I. Williams, shows a method which proves convenient in both exterior and interior work, for here water color washes were applied to a black and white print made from the original pencil drawing. Opaque color was used sparingly. One advantage of this method is that several color schemes can be quickly developed on extra prints, no redrawing being necessary.

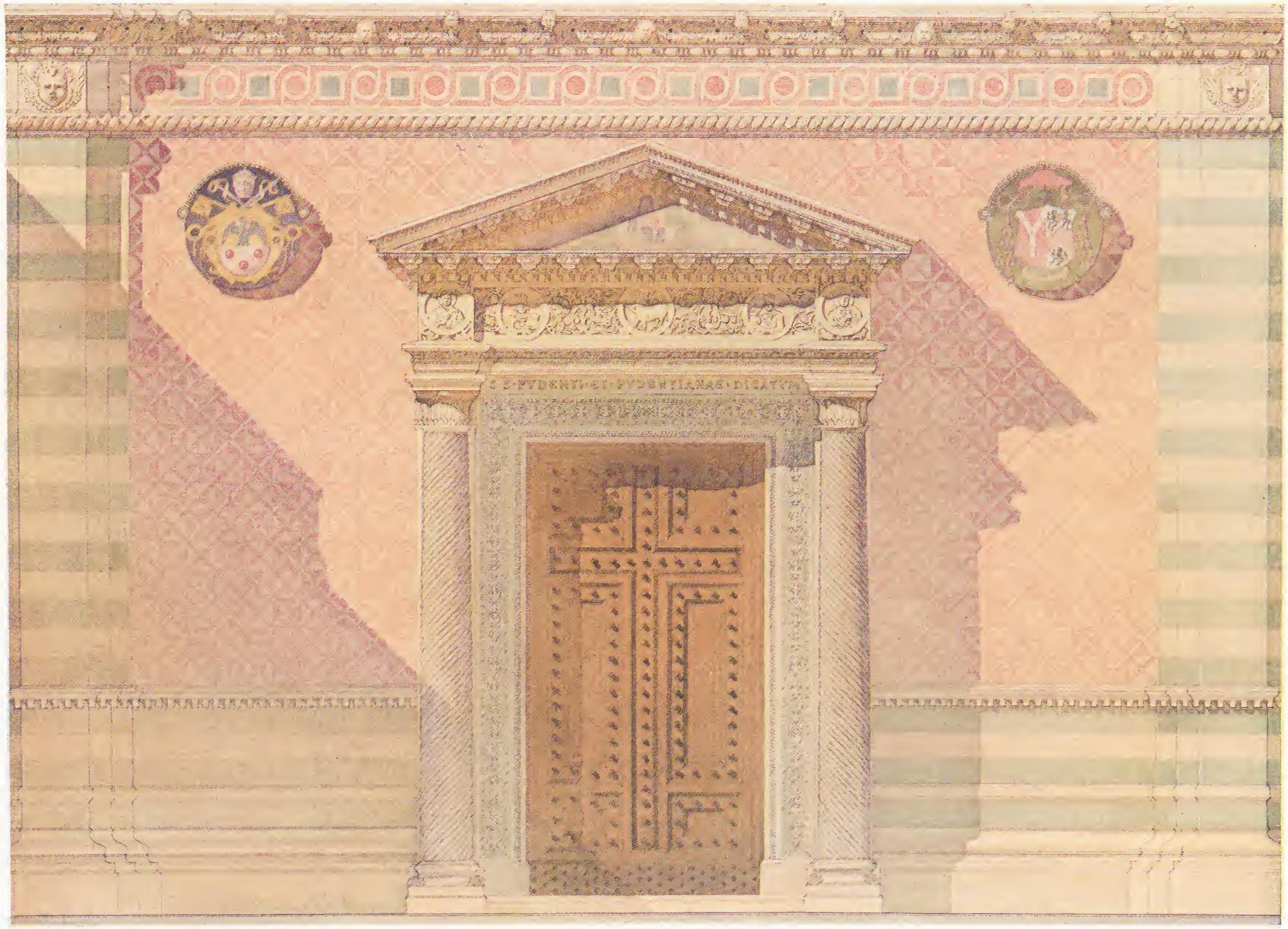
This drawing offers a feature not common to our other examples, yet often desirable—a complete cross-sectional profile through the adjacent walls with their cornices, window, window seat, etc. Thus this wall shows its relationship to the rest of the room, at the same time telling us more about itself.

It is helpful to compare this study by Williams with his other examples. See index.

Edward D. Stone has given us still another method in Plate 190, for here the main values are in pastel, with accents in tempera and gold. The pastel values were rubbed on, confined within templates. The small bright colored accents were applied with opaque water color. This general method was described quite fully in an article by Walter K. Smith, Jr., on "The Charcoal 'Smooch' Technique," in the March, 1932, issue of PENCIL POINTS.

Many times an elevation is of some restricted portion of an interior. Such a representation we have in the rendering by Alexander E. Hoyle, Plate 191. Here the tones are very colorful, as is made necessary by the character of the work. Shadows play an extremely important part in the rendering of elevations, for it is mainly through their use that we are able to obtain an expression of depth and detachment. In this case they have been cast at the conventional 45° angle, thus making plain to the architecturally trained observer the relative projection and recession of the principal members. This drawing was laid out carefully in pencil on a sheet of illustration board, the pencil lines still showing through the transparent washes with which most of the rendering was done. Some opaque touches were used. Complex as this subject is, the drawing is commendable for its simplicity and directness.

Though not, strictly speaking, an elevation, Carlo Ciampaglia's ceiling study, Plate 192, is treated much as an elevation would be. In fact, this somewhat resembles the previous drawing in its color and the scale of its pattern. The neatness and beauty of the work need no comment. The artist not only made this drawing, but designed and executed the ceiling, working in full collaboration with Harry Sternfeld, architect of the residence in which it occurs. The same general method used for Plate 191 was followed, the drawing first being carefully penciled on illustration board.

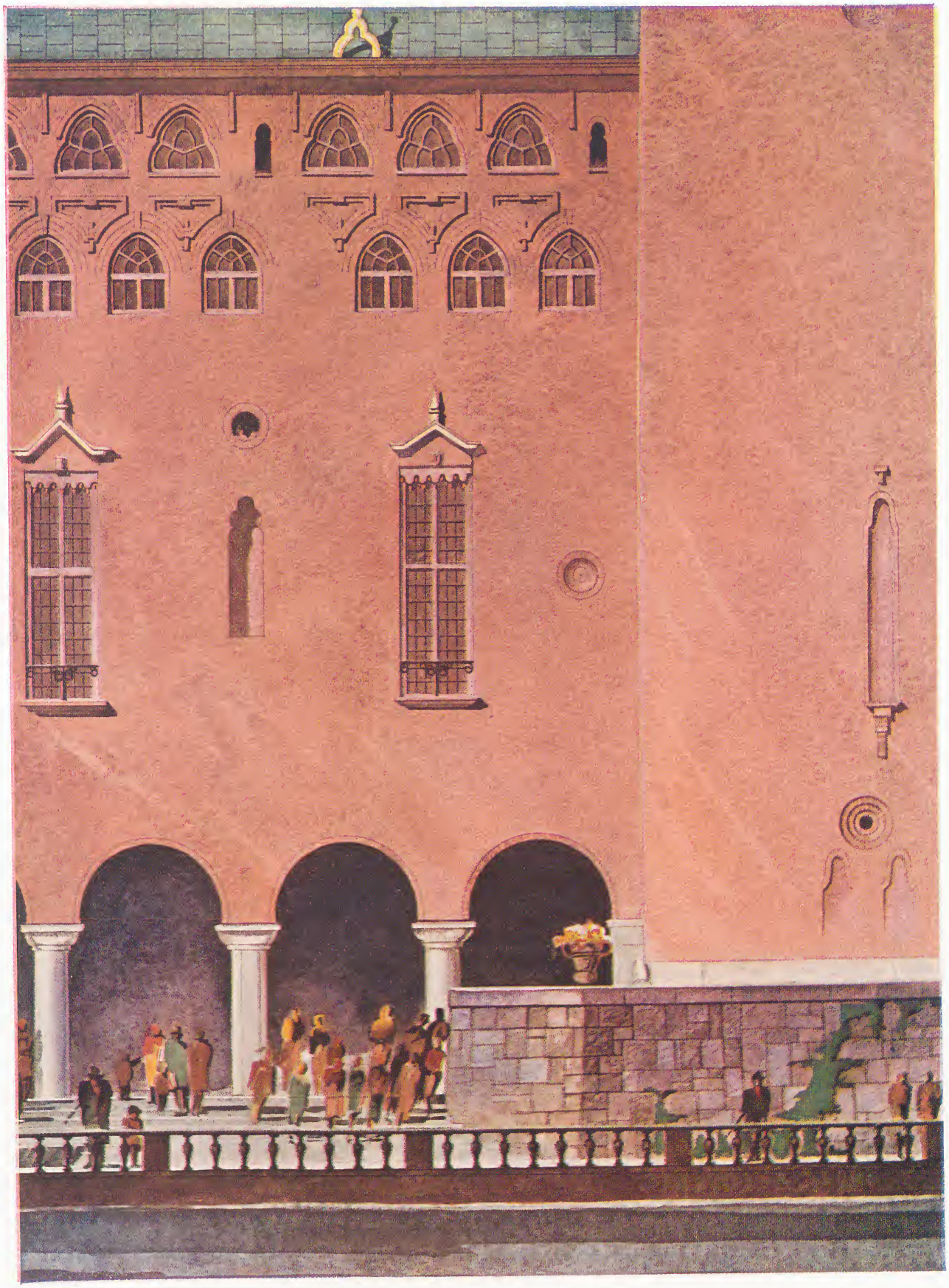


PORTION OF FAÇADE OF CHURCH OF SANTA PUDENZIANA, ROME, RENDERED IN WATER COLOR BY E. WARREN HOAK

The shadows were underpainted with India ink, the color then being applied as a stain. Original, about twice this size

WATER COLOR BY CECIL C. BRIGGS. STOCKHOLM CITY HALL TOWER

Note the decorative frame formed by clouds, lettering, and ship. Original, 46" x 80"



PORTION OF DRAWING BY CECIL C. BRIGGS SHOWN ON PLATE 167 REDUCED TO HALF SIZE

The preliminary line drawing was made with diluted ink on white paper

M. B. MEDARY'S BOK TOWER DRAWN BY H. RAYMOND BISHOP

The interest culminates in the features above. Original, 34" x 69"

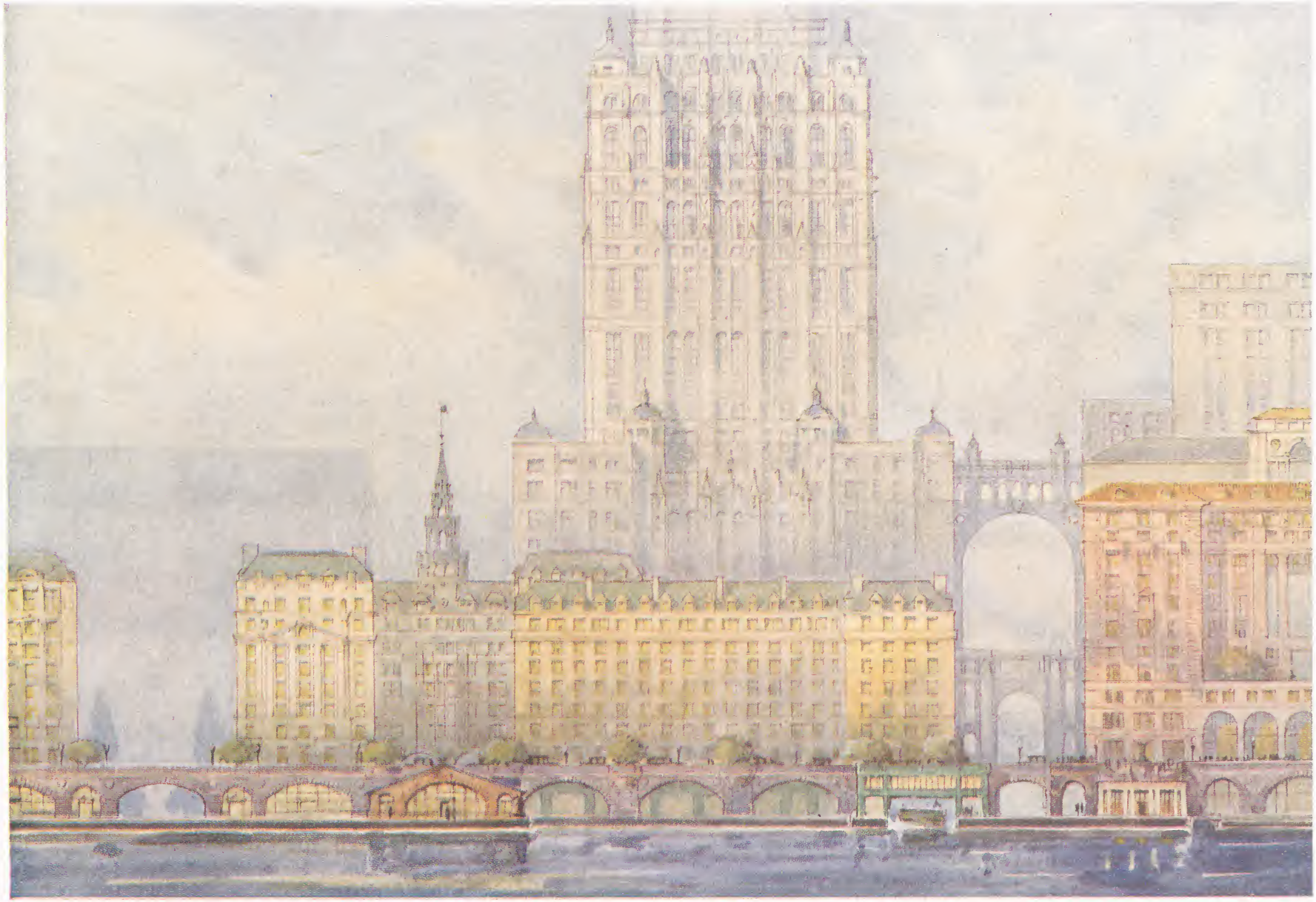
REPRODUCED AT FULL SIZE FROM RENDERING BY H. RAYMOND BISHOP SHOWN ON PLATE 169

By using dabs of broken color an extremely pleasing effect has been obtained

H. VAN BUREN MAGONIGLE'S DRAWING FOR THE PERRY MEMORIAL
A dignified handling, rich in color and well stabilized as to value. Original, 24" x 41"

PORTION OF DRAWING BY FRANCIS S. SWALES, ARCHITECT. EAST RIVER FRONT, MANHATTAN

In this drawing for the regional plan of New York transparent washes were run over brown ink line. Original, one-tenth larger



PORTION OF DRAWING BY FRANCIS S. SWALES, ARCHITECT. DEVELOPMENT PROJECT FOR EAST RIVER FRONT, MANHATTAN REGIONAL PLAN OF NEW YORK

See how by the use of successively cooler and less definite planes an effect of depth has been obtained. Reduced about one-half

ADMINISTRATION BUILDING, GOVERNOR'S ISLAND, NEW YORK. RENDERED BY SCHELL LEWIS FOR LORIMER RICH, ARCHITECT

This is essentially a pencil rendering to which washes of transparent color have been applied. Original, 16¼" wide

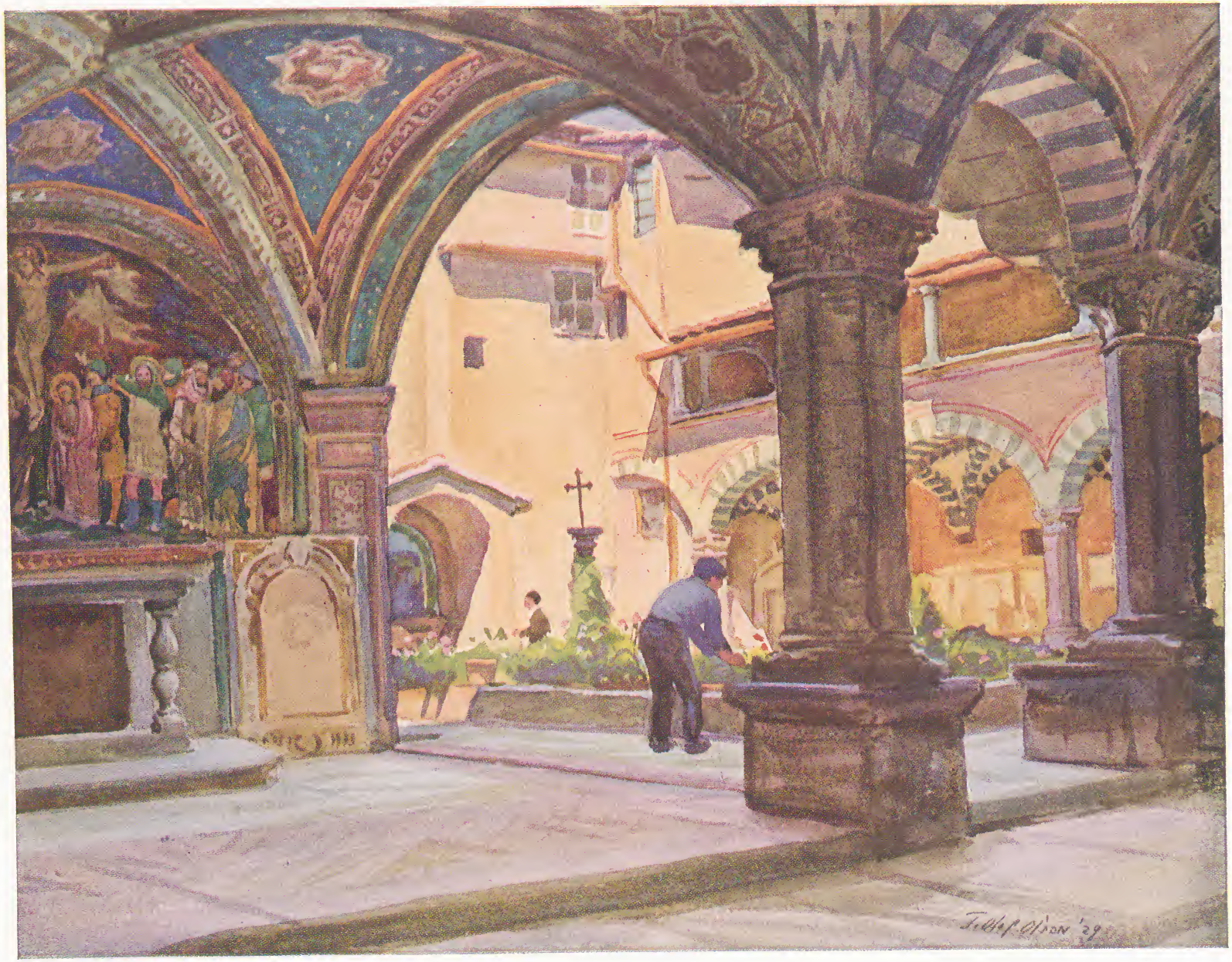
WATER COLOR BY VERNON HOWE BAILEY OF AN INTERIOR BY FRENCH AND COMPANY, INC.
Sketchy as this is, it records the essentials of the subject with remarkable fidelity. Original, 18" x 22"

WATER COLOR BY VERNON HOWE BAILEY—LIVING ROOM IN HOUSE OF CORNELIUS N. BLISS

This artist works freely, often completing a sketch with one large brush. Original, 15" x 20"

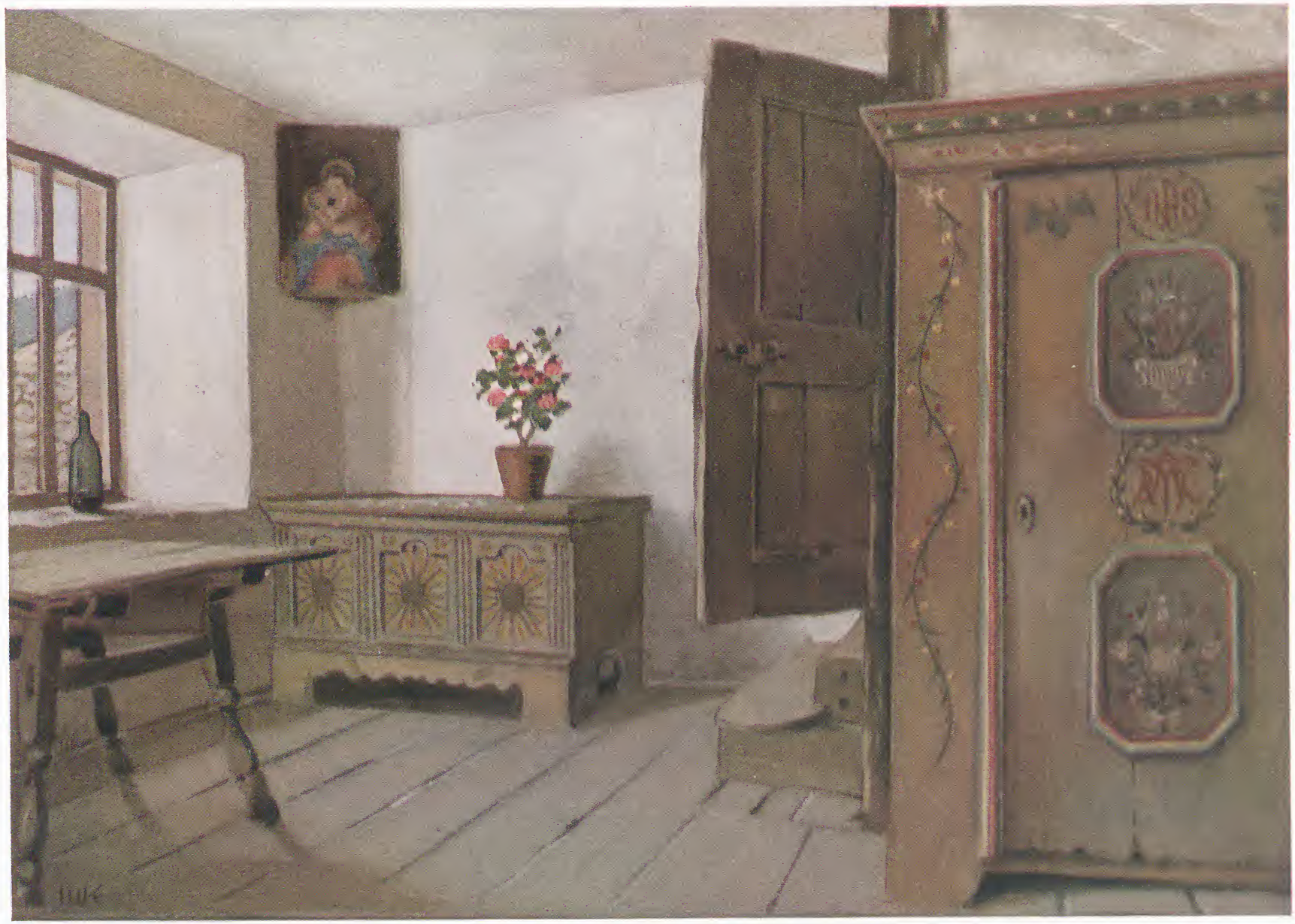
WATER COLOR BY VERNON HOWE BAILEY—SALON OF ROSPIGLIOSI PALACE, ROME, ITALY

Though bold, this is remarkably correct in the impression it creates. Original, 25" x 20"



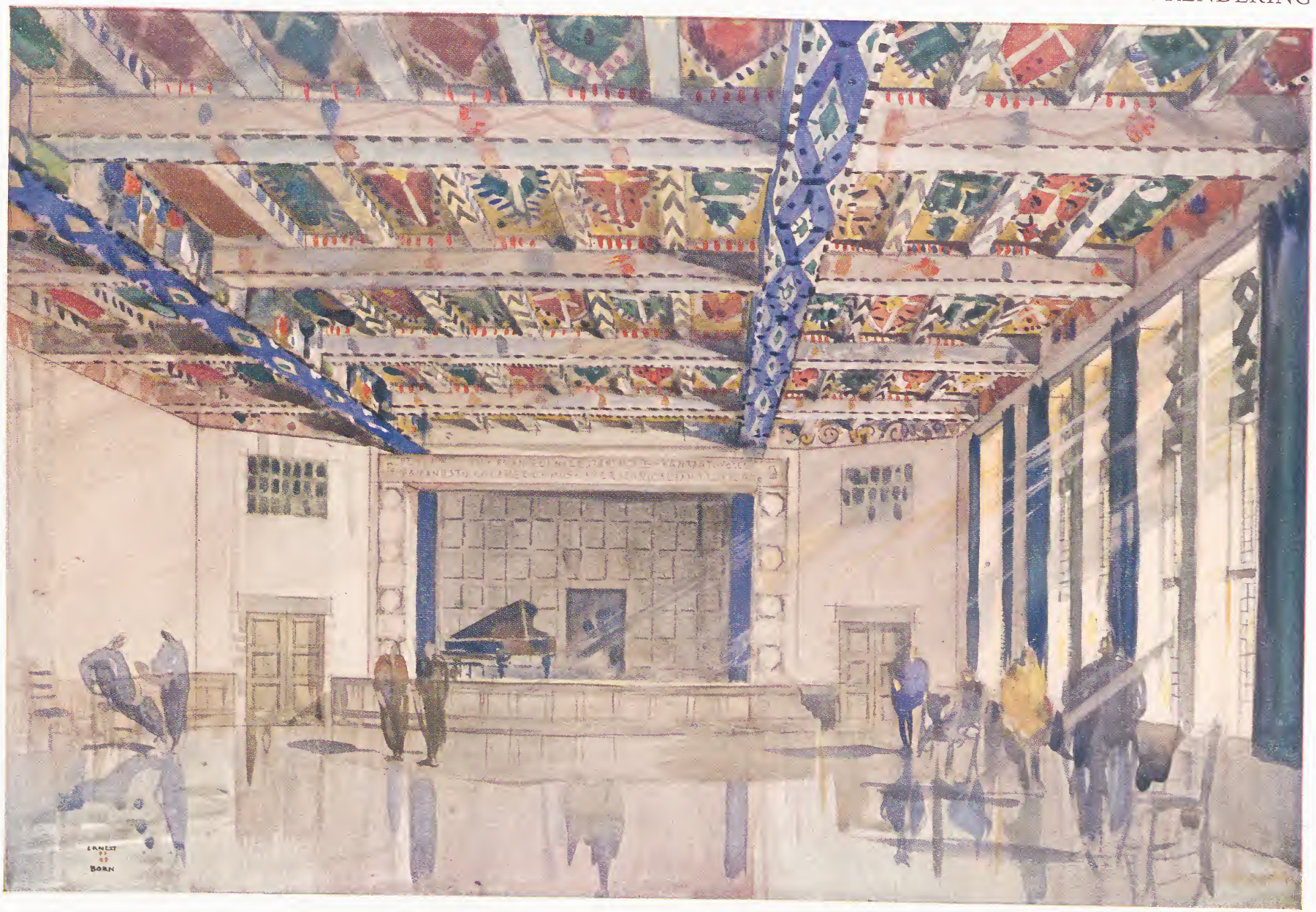
SANTA MARIA NOVELLA, FLORENCE, ITALY. PAINTED IN WATER COLOR BY J. OLAF OLSON

See how the rich yet subdued colors have been woven into a chromatic pattern of rare beauty. Original, 21½" x 16¾"



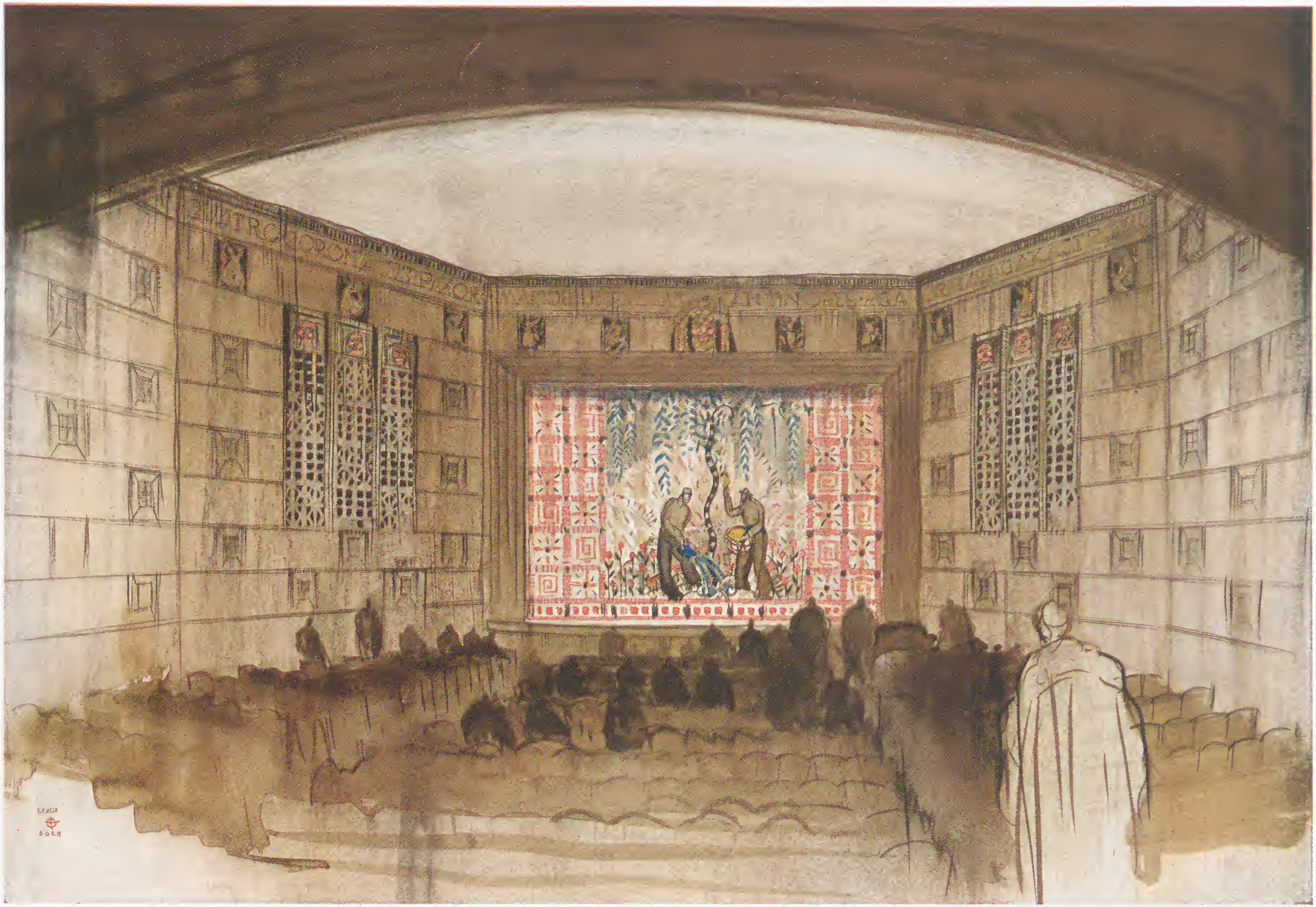
WATER COLOR DRAWING BY OGDEN W. KUGLER OF A PEASANT INTERIOR IN THE TYROL

The artist has caught, with simple means, a feeling of solid substance and honest atmosphere. Original, 11½" x 8¼"



WATER COLOR BY ERNEST BORN OF AN INTERIOR BY NECARSULMER AND LEHLBACH, AND GEHRON AND ROSS, ARCHITECTS

Despite its looseness, this conveys a surprising sense of reality: it is "carefully careless." Original, 27" x 19"



WATER COLOR BY ERNEST BORN OF AN AUDITORIUM BY NECARSULMER AND LEHLBACH, AND GEHRON AND ROSS, ARCHITECTS

This artist's power of indication could well be emulated by the student: note, for instance, the seats. Original, 27" x 19½"

CHAPTER XI

FURNITURE AND LIGHTING FIXTURES

TOGETHER WITH A FEW EXAMPLES OF STAINED GLASS

Not only must the renderer do complete rooms, or such portions of rooms as walls and ceilings, but he must know how to handle such details and accessories as furniture, lighting fixtures, leaded glass, polychrome terra-cotta, mosaic, ornamental hardware and the like. It seems needless for us to offer more than a few hints in this direction, however, for these involve no principles not already touched upon.

Perhaps the most confusing thing about furniture representation is the vast number of materials employed. The best way to master these is by sketching from the things themselves, noting how they change in appearance under different conditions. Our sketch by Henri Rapin of a proposed desk, Figure 76, gives some idea of the versatility needed. Note the treatment of the glass—see how effectively its thickness is suggested in green and white and how the wood shows through it somewhat indefinitely. Observe the graining of the wood in light and shade, and how opaque highlights brighten the whole. Some artists are now making renderings of furniture on thin paper-like sheets of actual wood, painting out or cutting away the unwanted portions.

Lighting fixtures have many points in common with furniture, though on the whole fewer materials are involved. The roundness of the forms may prove troublesome, with its revelation of many changes in value. Still life painting, or painting from actual fixtures, offers the best preparation.

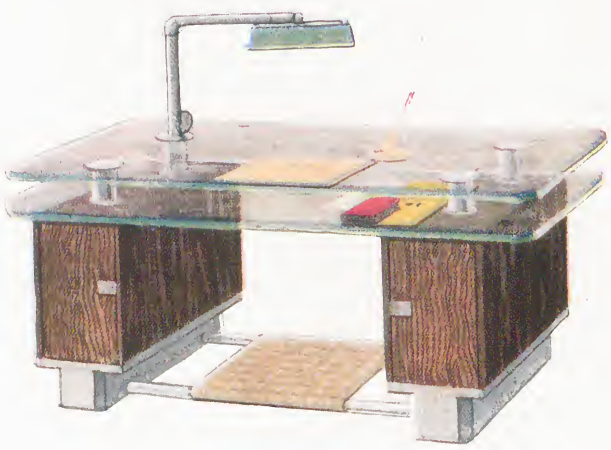


FIGURE 76

Designed and drawn by Henri Rapin

Victor S. Perlman's rendered designs, Plate 193 and Figures 77 and 78, are particularly fine examples of this class, commendable for their simplicity and crispness. Naturally if one works for some time in a particular branch of endeavor he acquires many clever little tricks. Here it will be noted that the pencil lines are not mechanically perfect; they are put in with dash and broken here and there; many are accented on the ends or at points of junction. The color is applied with similar crispness. Some white is left between strokes; again, dark accents have been added. It takes definiteness of purpose and sureness of touch to make such snappy renderings.

Such drawings are often done on tinted paper, opaque colors being applied for light areas and accents. Frequently a paper is selected of a hue suited to the representation of some specific material, as brownish red for copper, gray for nickel or silver, etc. Metallic papers are also used.

Draperies are by no means easy to represent: once more the best preparation is to work from the things themselves, though, as in all rendering, many tricks can be picked up by examining professional drawings. Study our scattered examples.

Stained glass, because of its translucency or transparency, offers special problems. Roughly speaking, there are two methods of approach. In the first, an attempt is made to picture the glass in all its brilliancy, as though actually in position against light. In such a case the leading is often shown black, perhaps in ink, and the glass is treated with rather bright pigments. Sometimes the whole is scrubbed down, to give texture, and then restored. In the second case, no effort is made to suggest the

light coming through the glass. Regardless of method, all sorts of media are combined, according to purpose. Pastel is quite popular when such work is at large scale or not too detailed, black paper customarily being chosen. Renderings of glass are often shellacked or varnished to simulate the real thing. Occasionally they are oiled, instead, to make them translucent; they can then be viewed advantageously against the light.

FIGURE 77

Designed and drawn by Victor S. Perlman

We offer, in Plates 194 and 195, two excellent representations, the first by Ralph Nickelsen and the second by Alfred E. Floegel. The first is a design for a new window, and the other a study of an existing one.

Mr. Nickelsen's customary procedure is as follows: He lays out the design roughly in charcoal, then makes a pencil drawing in which it is refined and improved. This is transferred to water color paper and transparent color is applied. The individual pieces of glass are modeled with brush, stump, eraser, or carbon pencil to give texture. India ink is used for the lead lines. Shellac is added to enrich the color and give more realistically the effect of glass.

Mr. Floegel's method is somewhat similar. His present subject is a portion of a mediaeval window. The design was first very carefully copied in pencil from the original glass. The lead lines were blacked with India ink. Again working from the window, the color was applied with transparent water colors, the modeling of each piece of glass being copied exactly. The whole was finally shellacked, allowance having been made for the consequent yellowing.

Mosaic, made as it usually is of marble, glass, and like materials, is rendered much like the glass, the main point of difference being that lights must often be left for the joints. Silver, gold, and other metallic paints are sometimes used in addition to the more common ones.

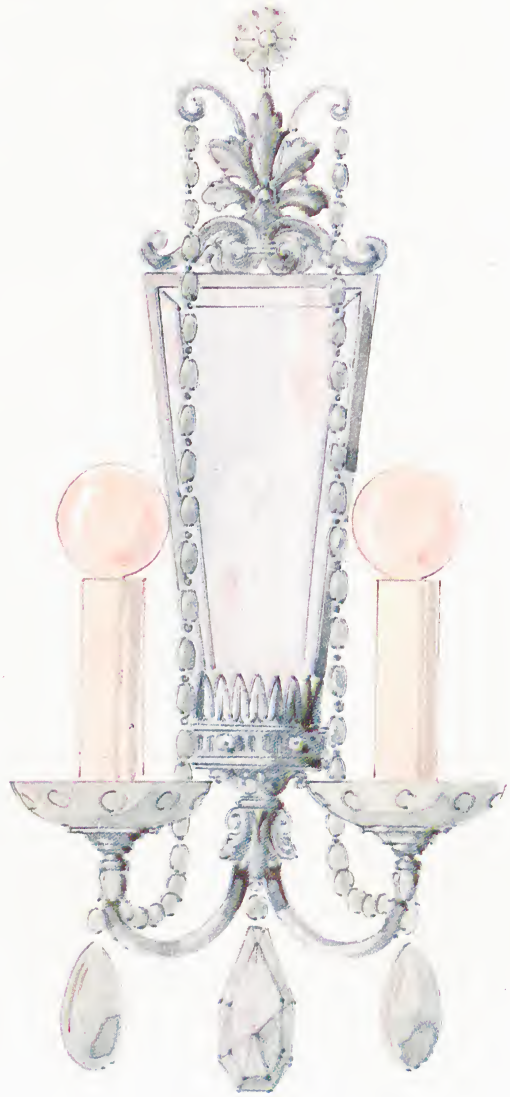


FIGURE 78

Designed and drawn by Victor S. Perlman

CHAPTER XII

PEOPLE; AUTOMOBILES; ACCESSORIES

THE BEGINNER'S FAULTS AND HOW TO AVOID THEM

Now, by way of conclusion, just a word on the use of accessories.

FIGURES Figures are especially important: they are often so badly drawn they prove harmful rather than helpful. Printed instructions are of little value, however; small scale figure sketching is a knack which demands practice rather than a textbook. We can merely supplement briefly some of the scattered suggestions already offered.

SCALE A main reason for including figures is to give scale—to make plain even to the layman the relative size of the proposed structure; figures *must* therefore be exactly right in size. A single figure near a building, if unreasonably large or small, can destroy its scale. Even figures away from the building, as in the foreground, are sometimes very misleading if not drawn to correct perspective measurement.

EYE LEVEL Figures should be properly located in relation to the eye level (horizon line). If, in laying out a building on level ground, this is taken five feet or so above the ground, the figures should be drawn with their eyes at approximately this same level, no matter how close or far away they may stand. Their heads, in other words, will be about in line. For examples, see Plates 152 and 161. If the spectator is viewing the structure from a higher position (if the horizon line is higher) the figures, if standing on level ground, will be beneath him, their heads, instead of coming in line, lying (on an average) in an imaginary horizontal plane perspectively placed at the proper distance below the eye, as in Plate 159. This plane, like that of the ground, will appear to slope upward, perspectively, to vanish in the horizon line. This is all a matter of knowing one's instrumental perspective, and so outside our present province.

GROUPING As a rule, figures should be grouped rather than scattered. The greater the number the greater the need. Groups may be small (two or three to a group) or large. It is often well in street scenes to mass many of the figures so they merge, few complete individual people being distinguishable. See, by way of illustration, the group at the right of Trumbull's drawing, Plate 162. Too many scattered figures detract from the architecture. Always use a reasonable number of people. A residence looks all right with none, or one or two: a larger building often appears bare without a half-dozen or so. A large building may have a strange four o'clock in the morning look if the streets are empty. Arrange your groups with a natural scattering of men, women, and children, carrying on the activities normal to the place. As exemplification of figure grouping, see in particular the renderings in Chapter VII, Part II.

ACTION Figures should not be posed in a stiff "facing the camera" position: there is nothing so deadening as to see a lot of people standing around artificially inactive. Not only does a sense of movement add life and interest, but as the eye of the spectator has a tendency to follow such motion, the renderer can often direct attention where he wishes by means of his figure treatment. If rendering a store, for example, he can lead the spectator's eye to the center of interest by showing many people entering or approaching its doors, suggesting the store's popularity. Discretion must be used, however. A well-known renderer showed so many people approaching a bank entrance that the officials feared the painting hinted at a run on the bank! Again, a bank officer voiced his displeasure because two loitering figures looked like bank robbers! Somewhat similar was an experience of the author's when a rendering was returned to him by an architect in a mid-western town whose client complained because a couple of people were shown crossing a street in the middle of the block, disregarding the law! Speaking of traffic, groups of figures or vehicles, held up by traffic, are frequently employed in large renderings.

One should usually arrange his figures with the utmost care by making some tracing paper studies. They must not noticeably tend to lead the eye out of the picture. Figures showing excess of motion are often bad, for they are conspicuous out of all proportion to their size. People doing unusual things or occupying strange positions have a powerful attractive force. A man pushing a wheelbarrow along a house ridge (to use an absurd example) would catch the eye very quickly, detracting from the architecture.

CONSISTENCY The all-too-common trick of the draftsman of utilizing figures traced from various sources sometimes leads to strange inconsistencies. Often he employs too many fashion plate figures which either show the mannerisms of the fashion artist or are inappropriate to the time or place depicted: such figures are likely to be too complete and exact, also, causing the renderer to work them up to an extreme degree. If figures are shaded, the direction of light employed for the architecture must be utilized. Particularly must their shadows, as on sidewalks or neighboring buildings, be thoughtfully handled. The figures in Plate 165, for instance, have shadows correctly breaking over the steps. These show the sort of simple indication which is preferred, too; they are cleverly managed.

METHOD There seems little to offer on figure representation beyond these general, and perhaps too obvious, hints. Figure drawing, as taught in art classes, helps, of course, but the best training is to paint small scale figures over and over until a power of suggestion is developed. Indications by other artists hold suggestions: our pages are filled with examples which one can analyse, and, if so inspired, copy. The trick of presenting figures without features, or even lacking feet, is not rare: see the renderings by McCrackin, page 293, and Decaris, page 91. Even hands and forearms can be omitted, as in Chase's drawing, page 144.

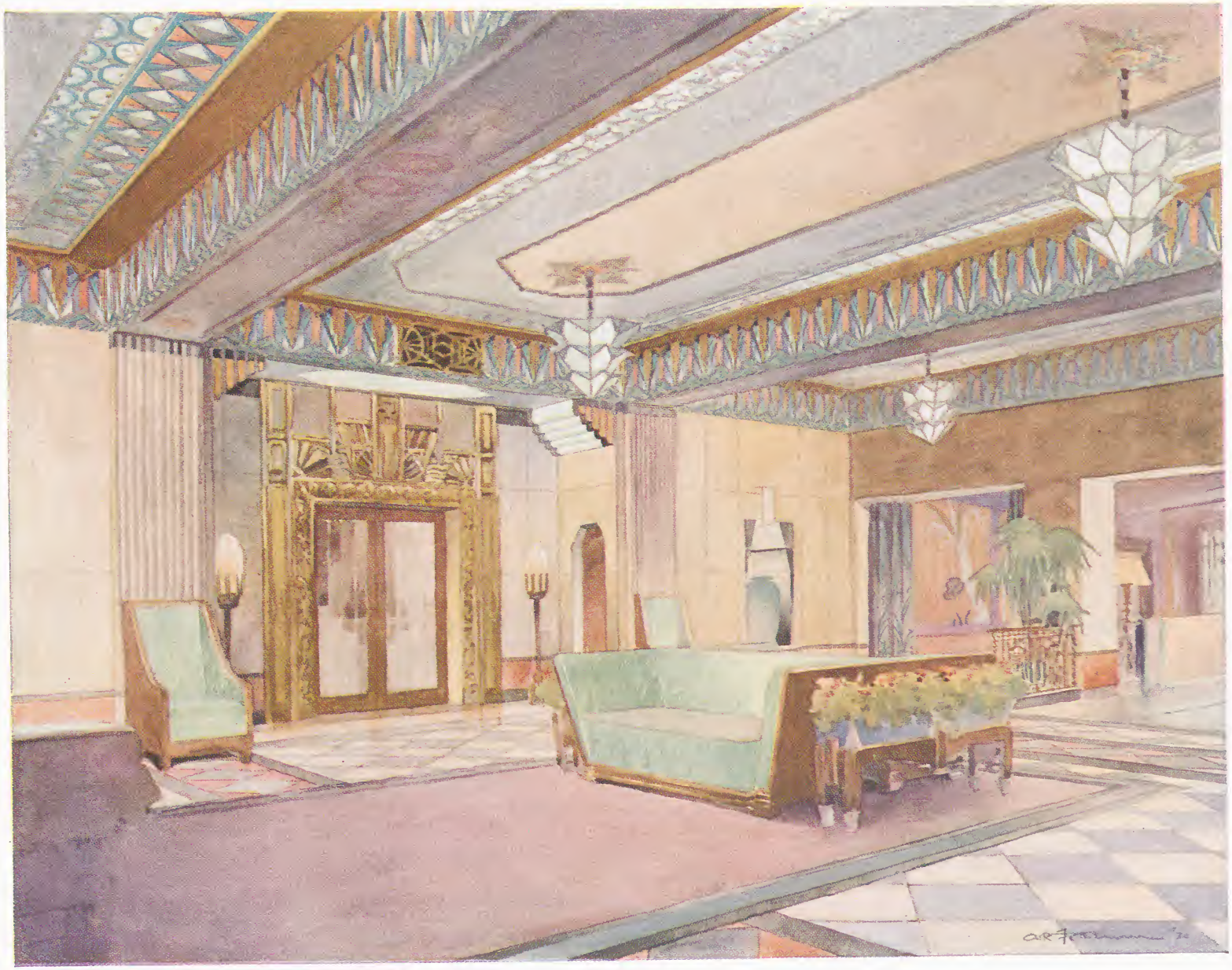
As to consistency of treatment, figures and architecture should be similarly managed: one could scarcely imagine other than carefully finished figures in a study like that by Hawley, page 186, yet see how much more freely this same artist has expressed them on page 215. Ghost figures, through which the architecture beyond can be seen, are by no means rare—see Gehron's drawing, page 230. Their transparency is usually due to their being the last things done: though puzzling to the client, this lack of solidity is not considered by the renderer to be a defect. If desired, heavier opaque color will overcome it. As to the color of clothing, the main thing is to have it spot well, chromatically, with the colors of the rest of the composition. Plates 152, 163, and 168 show what we mean; the dark and bright spots are distributed where they seem natural and count effectively.

VEHICLES Much that we have said about figures applies also to automobiles and other vehicles. These should, of course, be of proper size, consistent type, and correctly drawn in perspective. They should not be too conspicuous in design, color, placing, or indication of speed. Clients often notice if they are shown so driven or parked as to violate local regulations. Time was when the renderer needed skill in the representation of horses and horse-drawn vehicles. Old renderings by Hawley, for instance, gave no end of attention to such things. As they were hard to do well, today's renderers have much to be thankful for. Trolleys, busses, and other large units usually attract too much attention excepting in renderings of massive structures. Airplanes are among the accessories which the young renderer is inclined to over-emphasize. Unless at tiny scale (see extreme top of Plate 159) they are usually better omitted.

REFERENCE MATERIAL It will prove helpful to the renderer to keep on file catalogues of automobiles, boats, etc., as well as sketches and photographs of people, animals, and the like. He will frequently need them.

WATER COLOR RENDERING BY CARROLL BILL OF AN INTERIOR BY McLAUGHLIN AND BURR, ARCHITECTS

This straightforward example clearly shows the original pencil layout. Original, 22" x 16"

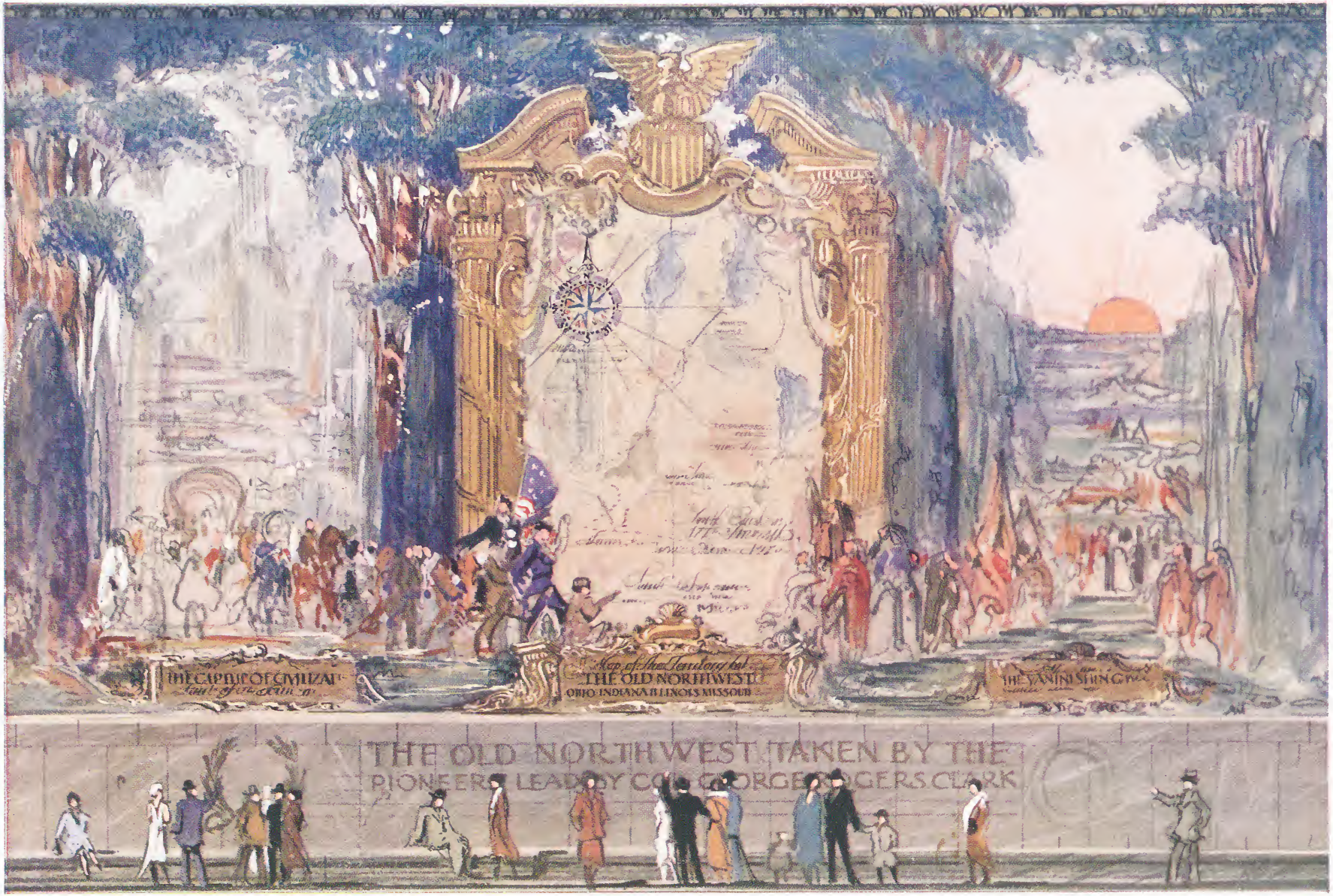


WATER COLOR STUDY BY O. R. FREEMAN FOR A HOTEL LOBBY BY H. NEWTON MARSHALL COMPANY, DECORATORS

This rendering was actually used as a "working drawing" for the development of the decorations

WATER COLOR RENDERING BY STANLEY W. E. GREEN OF INTERIOR FOR A LADIES' PARLOR BY CRAM AND FERGUSON

Careful renderings of this type are needed for many important projects. Note the rugs, draperies, etc. Original, 28½" x 17"



COLOR STUDY OF INTERIOR TREATMENT, GEORGE ROGERS CLARK MEMORIAL, BY FREDERIC C. HIRONS, ARCHITECT

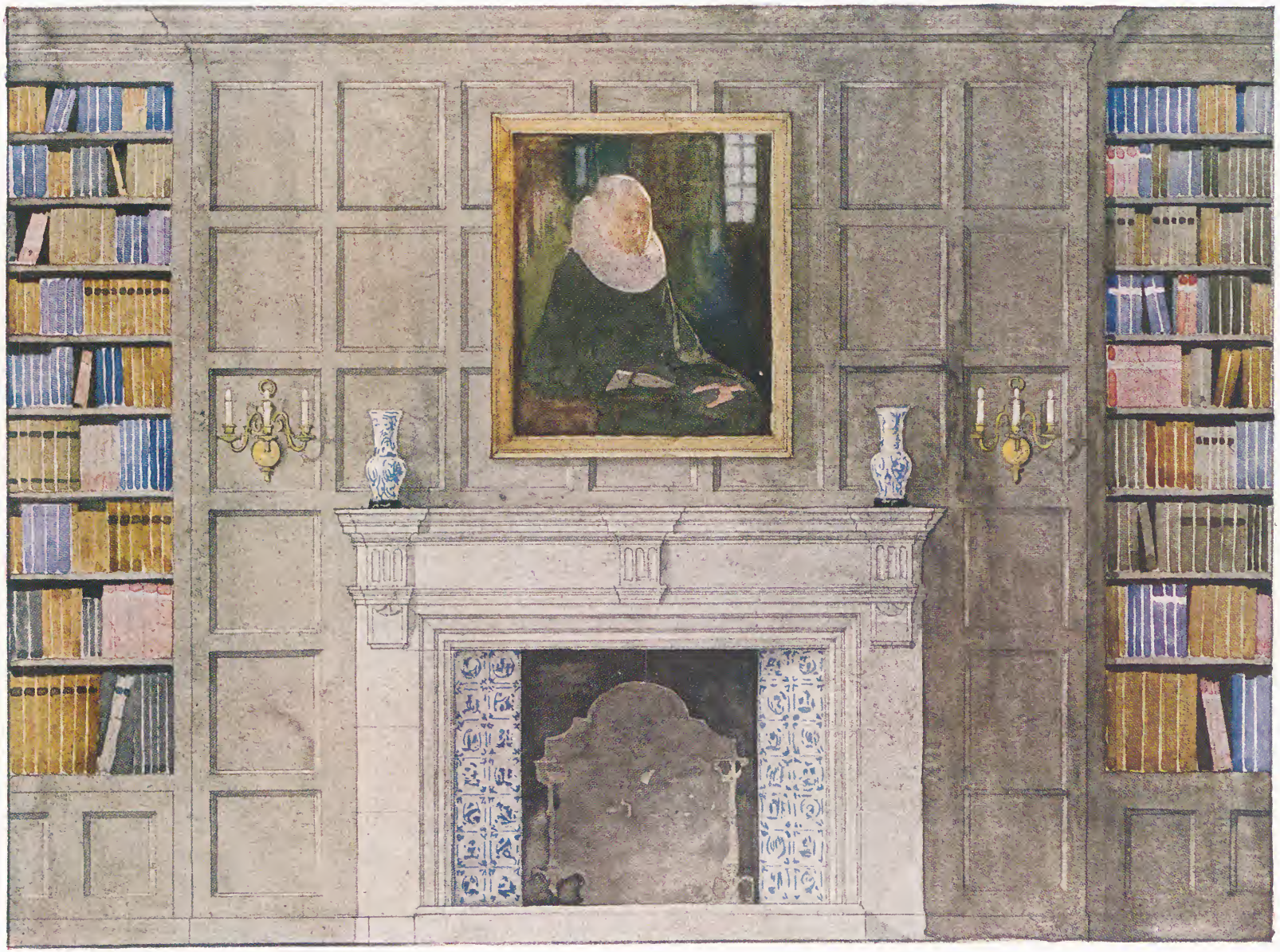
The attention is skilfully focussed on the center of interest by the arrangement of color. Original, 17" x 7½"

RENDERING IN OPAQUE WATER COLOR FROM OFFICE OF HOWARD GREENLEY

Showroom for Colgate & Co. The decorative disposition of brush marks is worth study.
Original, 11¾" x 16¼"

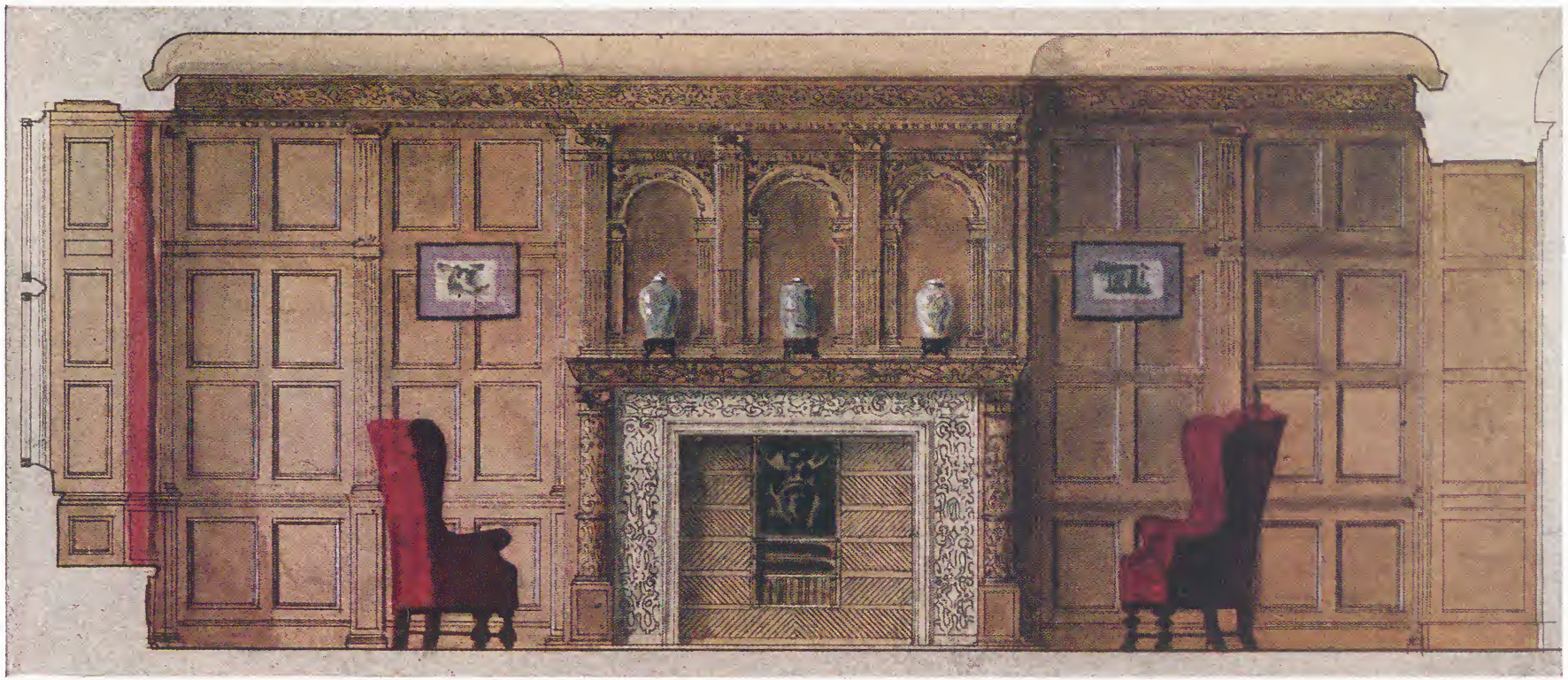
OIL PAINTING BY E. DONALD ROBB OF AN IMAGINARY CATHEDRAL AMBULATORY

Proving that oil paints, properly used, can give us exact detail. Original, 15¼" x 22¼"



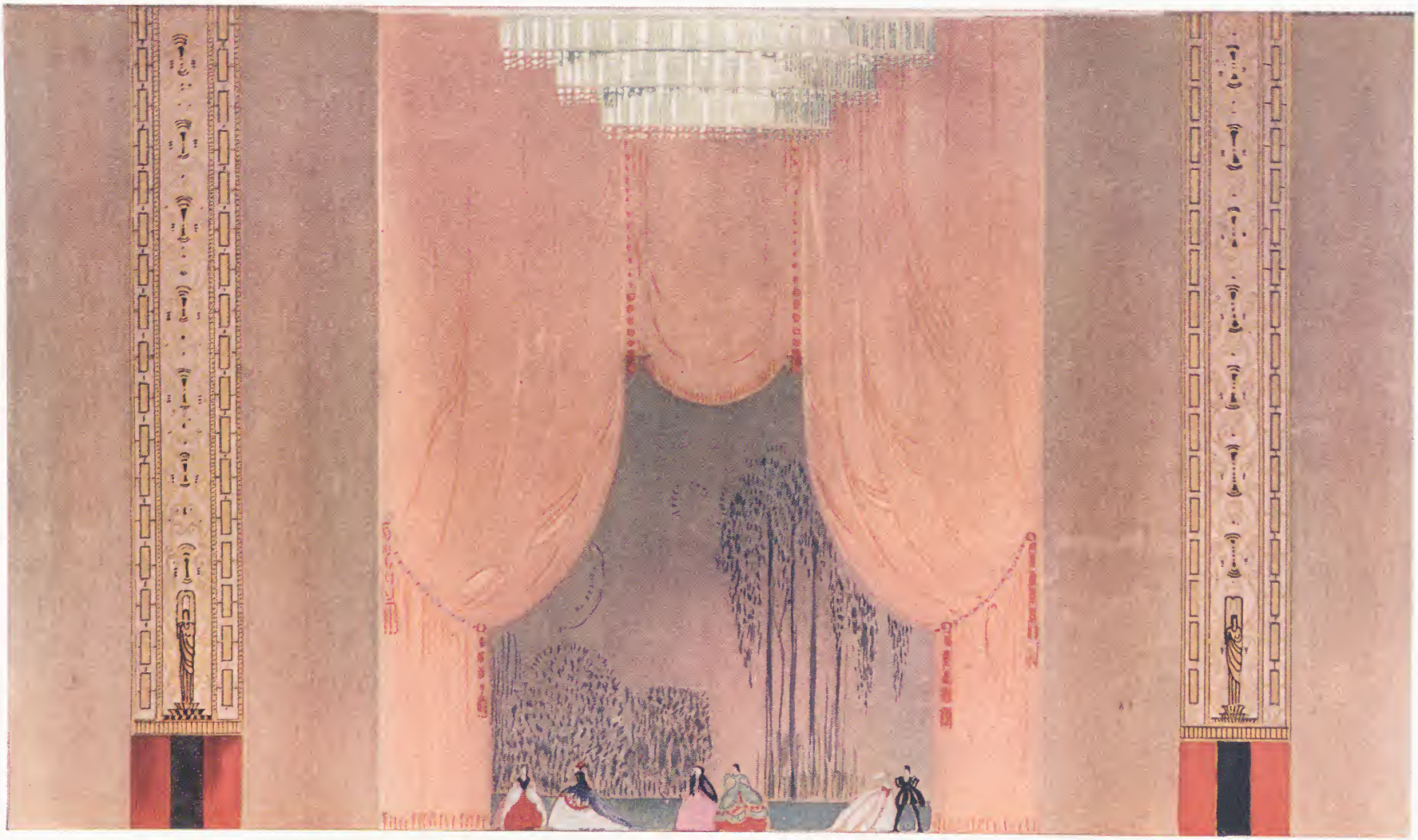
WATER COLOR RENDERING BY A. B. LE-BOUTILLIER—INTERIOR BY RIPLEY AND LE-BOUTILLIER, ARCHITECTS

Elevations are customarily more highly conventionalized than are perspectives. Original, 11¼" x 8½"



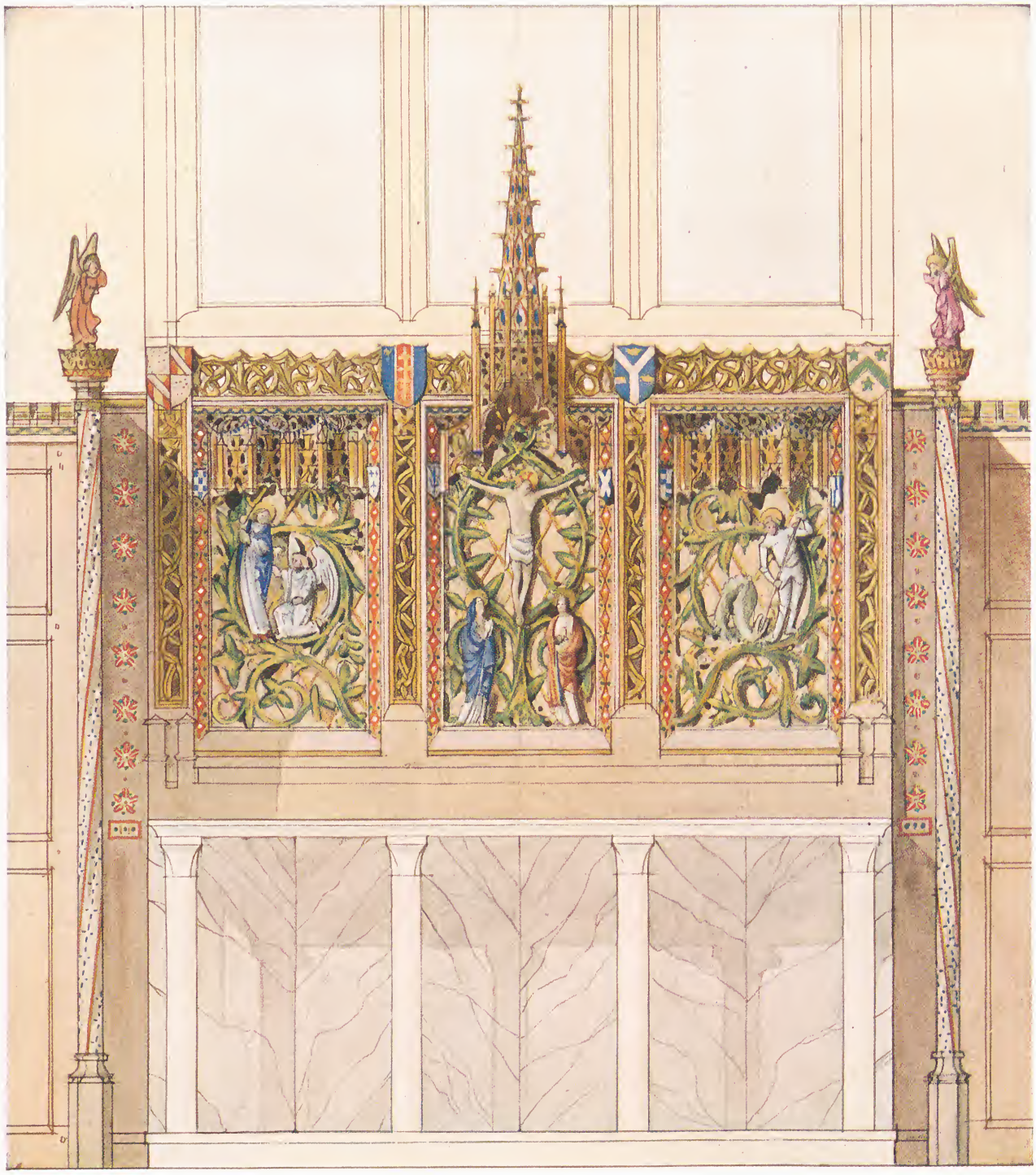
WATER COLOR RENDERING BY EDGAR I. WILLIAMS, ARCHITECT—INTERIOR, APARTMENT OF MRS. C. R. HOLMES, NEW YORK

Water colors were here used on a black and white print of a pencil drawing. Original, 18" x 7¾"



PRELIMINARY SKETCH BY EDWARD D. STONE FOR REINHARD & HOFMEISTER: CORBETT, HARRISON & MacMURRAY; HOOD & FOUILHOUX, ARCHITECTS

A pastel "smooch" technique was used to show a proposed interior for the Roxy Theatre. Original, 15¾" x 9¼"



RENDERING BY ALEXANDER E. HOYLE OF AN ALTAR AND REREDOS BY CRAM AND FERGUSON, ARCHITECTS

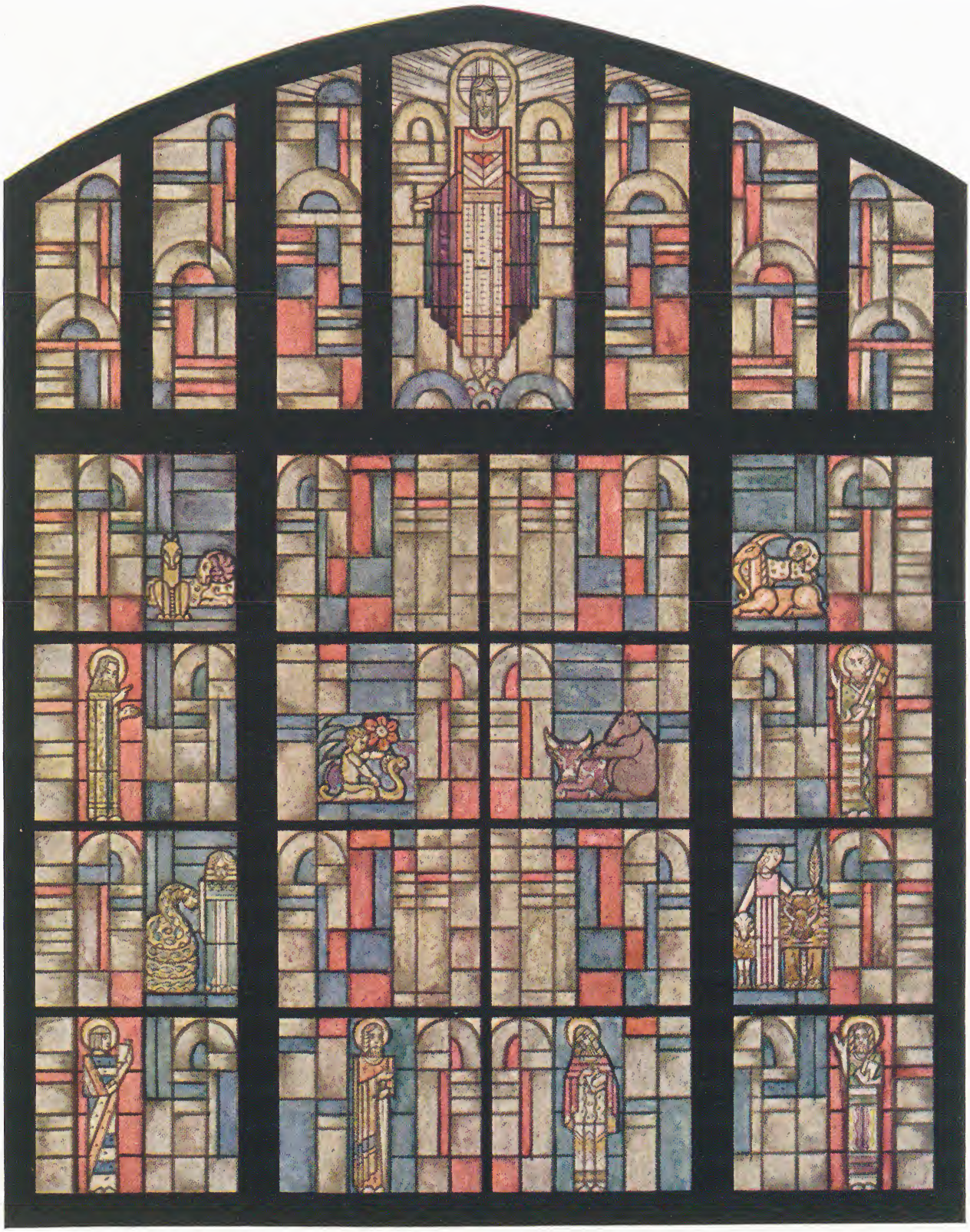
A thoroughly workmanlike treatment worthy of careful inspection. Original, 11″ x 12¼″

DECORATED CEILING DESIGNED AND DRAWN IN WATER COLOR BY CARLO CIAMPAGLIA

The artist of this drawing executed the decoration of the ceiling itself. Original, 9½" x 12¾"

LIGHTING FIXTURE DESIGNED AND RENDERED IN WATER COLOR
BY VICTOR S. PERLMAN

This elevation shows a crispness which merits careful analysis



A MODERN WINDOW DESIGNED AND RENDERED IN WATER COLOR BY RALPH NICKELSEN

This drawing was shellacked to add to its realistic effect. Original, 14½" high

PORTION OF A WINDOW AT LE MANS DRAWN IN WATER COLOR BY ALFRED E. FLOEGEL

Here we have a serious study from an existing window, done with the utmost care. Original, about 8¾" square

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